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S. R. C.



ABSTRACT

OF

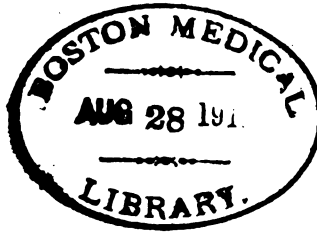
The Proceedings of the Association of
Life Insurance Medical Directors
of America from Organization
to and Including the Six-
teenth Annual Meeting.

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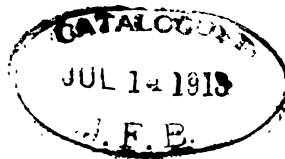


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THE ASSOCIATION OF LIFE INSURANCE
MEDICAL DIRECTORS OF AMERICA



**Compiled by the Secretary
by
Order of the Association**

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OSCAR H. ROGERS, M.D.....*Vice-President*
THOMAS H. WILLARD, M.D.....*2nd Vice-President*
BRANDRETH SYMONDS, M.D.....*Secretary*
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GEORGE R. SHEPHERD, M.D.....*Elected*
ELIAS J. MARSH, M.D.....*Elected*

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JOHN M. KEATING, M.D.....	1889-1891
<i>Resigned because of ill health.</i>	
FRANK WELLS, M.D.....	1891-1894
EDGAR HOLDEN, M.D.....	1894-1897
H. CABELL TABB, M.D.....	1897-1899
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EDWARD H. HAMILL, M.D.....	1902-1905
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EDWARD H. HAMILL, M.D.....	1899-1902
JOHN W. FISHER, M.D.....	1902-1905

2nd Vice-Presidents

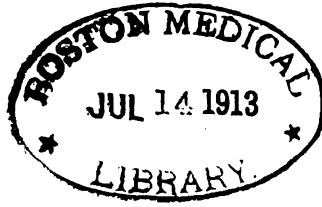
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ELIAS J. MARSH, M.D.....	1891-1894
OSCAR H. ROGERS, M.D.....	1894-1900
BRANDRETH SYMONDS, M.D.....	1900-

Treasurers

J. W. BRANNAN, M.D.....	1889-1899
F. S. GRANT, M.D.....	1899-1903
A. S. KNIGHT, M.D.....	1903-



An Abstract of the Proceedings
OF THE
Association of
Life Insurance Medical Directors
of America.

PRELIMINARY MEETING.

At the suggestion of Dr. John M. Keating, Medical Director of the Penn Mutual Life Insurance Company, an informal meeting of the Medical Directors of the Life Insurance Companies of the United States was held at the Union League Club, in New York City, on May 29th, 1889. The following named gentlemen were present at the meeting: Dr. Barrows, of the Phoenix; Dr. Bernacki, of the Germania; Dr. Brannan, of the Washington; Dr. Chapin, of the Massachusetts Mutual; Dr. Curtis, of the Equitable; Dr. Davis, of the Travelers; Dr. Donaldson, of the Maryland Life; Dr. Foster, of the Union Mutual; Dr. Gage, of the State Mutual; Dr. Gillette, of the Mutual; Dr. Grant, of the Provident Savings; Dr. Holden, of the Mutual Benefit; Dr. Huntington, of

Preliminary Meeting.

the New York Life; Dr. Keating, of the Penn Mutual (who acted as President *pro tem.*); Dr. Lambert, of the Equitable; Dr. Munn, of the United States; Dr. Paddock, of the Berkshire; Dr. Rex, of the Penn Mutual; Dr. Russell, of the Ætna; Dr. Shepherd, of the Connecticut Mutual; Dr. Storrs, of the Connecticut General; Dr. Tabb, of the Virginia Life; Dr. Tuck, of the New York Life; Dr. Van Wagenen, of the Mutual Benefit; Dr. Wells, of the John Hancock (who acted as Secretary *pro tem.*); Dr. Winston, of the Mutual; Dr. Wood, of the State Mutual; and Dr. Young, of the Mutual Benefit.

It was decided, after discussion, to appoint a Committee to consider the expediency of establishing a permanent organization of the Medical Directors of the Life Insurance Companies of America and to devise a plan therefor. The Committee was also empowered to call a meeting of the Medical Directors when in its estimation it was deemed necessary to do so.

MEETING FOR PERMANENT ORGANIZATION.

Pursuant to a call of the Special Committee appointed at the meeting held on May 29th, 1889, the Medical Directors came together at the Cambridge Hotel, in New York, on December 6th, 1889. There were present: Drs. Bernacki, Bisbee, Brannan, Davis, Foster, Gillette, Grant, Holden, Huntington, Keating, Lambert, Munn, Shepherd, Tuck, Van Wagenen, Wells, Winston and Young.

After discussion and amendment the following Constitution was adopted:

Association of Life Insurance Medical Directors.

CONSTITUTION.

ARTICLE I.

THE NAME.

This organization shall be called the Association of Life Insurance Medical Directors.

ARTICLE II.

THE OBJECT.

It has for its object the promotion of medical science, as applied to life insurance, by personal intercourse of its members, presentation of papers, discussions and such other methods as may be found desirable, and also the encouragement of social and friendly relations between its members, and the advancement of the general interests of life insurance.

ARTICLE III.

MEMBERSHIP.

The membership of this Association shall consist of the original subscribers and such other Life Insurance Medical Directors as shall be duly elected.

Meeting for Organization.

ARTICLE IV.

OFFICERS.

The officers shall consist of a President, a First and a Second Vice-President, a Secretary and a Treasurer.

ARTICLE V.

EXECUTIVE COMMITTEE.

The President, Secretary and Treasurer and four other members, not officers, shall constitute the Executive Committee.

ARTICLE VI.

DUTIES OF OFFICERS.

The duties of the Officers shall be such as usually appertain to their respective offices.

ARTICLE VII.

DUTIES OF THE EXECUTIVE COMMITTEE.

The duties of the Executive Committee shall be the general management of the affairs of the Association in the intervals between its meetings, to call meetings, and to make arrangements for the same, to decide upon papers offered for reading and discussion, and to pass upon candidates to be presented to the Association for election.

ARTICLE VIII.

ELECTION OF OFFICERS AND EXECUTIVE COMMITTEE.

The officers and the members of the Executive

Committee shall be elected by ballot at the annual meeting of the Association, for the term of one year, or till their successors have been elected and qualified. The President and Vice-Presidents shall not be eligible for the same office for more than three consecutive years.

ARTICLE IX.

MEETINGS.

The annual meeting of the Association shall be held on such day, time and place as may be decided upon by the Executive Committee. Other meetings of the Association may be called by the Executive Committee from time to time, and shall be called by the President at any time upon the written request of ten members. Ten days' notice of all meetings shall be given by the Secretary.

ARTICLE X.

ELECTION OF MEMBERS.

All candidates for membership shall be nominated to the Executive Committee in writing by at least two members. The name of any candidate which shall be voted against by two members of the Executive Committee shall be considered withdrawn. Each member of the Executive Committee shall be informed by the Secretary of the names of candidates, at least ten days before the meeting of the Executive Committee at which their names are to be considered. Candidates recommended by the Executive Committee shall be balloted for at the

next meeting of the Association. A candidate for membership receiving three-fourths of the votes cast shall be declared elected. Failure to pay the election fee and annual dues within thirty days after notice of election shall render such election null and void.

ARTICLE XI.

QUORUM.

Four members of the Executive Committee shall constitute a quorum. Ten members of the Association at any duly called meeting shall constitute a quorum.

ARTICLE XII.

DUES.

Each member shall pay an admission fee of two dollars (\$2.00) and an annual assessment of one dollar (\$1.00), payable on the first day of January of each year, and any member who is delinquent in his assessment for sixty days, after written notice from the Secretary, shall be considered as having resigned his membership. Members, having thus lost their membership, shall, if re-elected within six months, be released from paying a second admission fee.

ARTICLE XIII.

AMENDMENTS.

This constitution may be amended by a vote of two-thirds of the members present at any meeting,

Officers Elected.

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held at least three months after notice of any proposed amendment shall have been sent to each member by the Secretary.

The following named gentlemen were then elected Officers of the Association for the ensuing year:

PRESIDENT.

DR. JOHN M. KEATING.

VICE-PRESIDENT.

2D VICE-PRESIDENT.

DR. G. W. RUSSELL. DR. LEWIS McKNIGHT.

SECRETARY.

TREASURER.

DR. FRANK WELLS. DR. J. W. BRANNAN.

EXECUTIVE COMMITTEE.

DR. EDGAR HOLDEN. DR. HENRY TUCK.
DR. E. W. LAMBERT. DR. G. S. WINSTON.

Meeting for Organization.

ORIGINAL MEMBERS.

The following named gentlemen were the original members:

DR. G. W. RUSSELL.....	Aetna Life Insurance Co.
DR. F. K. PADDOCK.....	Berkshire Life Insurance Co.
DR. M. STORRS.....	Connecticut General Life Insurance Co.
DR. G. R. SHEPHERD.....	Connecticut Mutual Life Insurance Co.
DR. EDWARD CURTIS.....	} Equitable Life Assurance Society.
DR. E. W. LAMBERT.....	
DR. C. BERNACKI.....	Germania Life Insurance Co.
DR. FRANK WELLS.....	John Hancock Mutual Life Insurance Co.
DR. H. C. TABB.....	Life Insurance Co. of Virginia.
DR. M. B. DUBOIS.....	Manhattan Life Insurance Co.
DR. F. DONALDSON.....	Maryland Life Insurance Co.
DR. F. W. CHAPIN.....	Massachusetts Mutual Life Insurance Co.
DR. H. F. LYSTER.....	Michigan Mutual Life Insurance Co.
DR. EDGAR HOLDEN.....	} Mutual Benefit Life Insurance Co.
DR. G. A. VAN WAGENEN.....	
DR. J. C. YOUNG.....	
DR. W. R. GILLETTE.....	} Mutual Life Insurance Co.
DR. G. S. WINSTON.....	
DR. A. B. BISBEE.....	National Life Insurance Co.
DR. A. HUNTINGTON.....	} New York Life Insurance Co.
DR. HENRY TUCK.....	
DR. LEWIS McKNIGHT.....	Northwestern Mutual Life Insurance Co.
DR. J. M. KEATING.....	} Penn Mutual Life Insurance Co.
DR. O. P. REX.....	
DR. A. W. BARROWS.....	Phoenix Mutual Life Insurance Co.
DR. THOMAS WISTAR.....	Provident Life and Trust.
DR. F. S. GRANT.....	Provident Savings Life Assurance Society.
DR. T. H. GAGE.....	} State Mutual Life Insurance Co.
DR. ALBERT WOOD.....	
DR. G. P. DAVIS.....	Travelers Life Insurance Co.
DR. W. B. DAVIS.....	Union Central Life Insurance Co.
DR. T. A. FOSTER.....	Union Mutual Life Insurance Co.
DR. J. P. MUNN.....	United States Life Insurance Co.
DR. JOHN W. BRANNAN....	Washington Life Insurance Co.

THE FIRST ANNUAL MEETING—1890.

The First Annual Meeting of the Association was held at the Buckingham Hotel, in New York City, on May 30th, 1890. There were present Drs. Barrows, Bernacki, Bisbee, Brannan, Chapin (Mass. Mut.); Curtis, Davis (G. P.); Davis (W. B.); Foster, Gage, Grant, Huntington, McKnight, Munn, Paddock, Russell, Shepherd, Storrs, Tabb, Thorburn, Tuck, Van Wagenen, Wells, Winston, Wistar, Wood and Young.

The following gentlemen were elected to membership: Dr. J. W. Fisher, of the Northwestern Mutual of Milwaukee, Wis.; Dr. Edward H. Hamill, of the Prudential of Newark, N. J.; Dr. James Thorburn, of the North American of Toronto, Ontario; Dr. J. H. Webb, of the Ontario Mutual of Waterloo, Ontario; Dr. George Wilkins, of the Sun Life of Montreal, P. Q.

DR. BERNACKI then read an interesting paper on the

“INFLUENCE ON LONGEVITY OF THE USE OF
LARGE QUANTITIES OF BEER.”

He said that his paper was based particularly on Professor Oertel's work on the “Therapy of Disorders of the Circulation, especially with reference to the consumption of large quantities of Beer.” This was published in 1885, before which time physicians who had studied in Germany had thought that the use of beer—even in large quantities—was not dangerous, but was beneficial, and accordingly had recommended it in

this country, and had given testimonials that the working people in the breweries who drank a great deal of beer were robust, strong and long-lived. Professor Oertel had shown that in the Munich hospitals, out of a thousand post-mortem examinations, 32 men and 14 women—that is to say, 4.6 %—have died of dilatation and hypertrophy of the heart; and in addition to that, that 23 men and 14 women—or 3.3 %—had died of some other disease with dilatation and hypertrophy of the heart as accessory causes. A further examination of 2000 post-mortems by Bollinger had given the same result, so that about 8 % of the deaths in the Munich hospital were due to this condition of the heart.

The mechanical explanation of this pathological condition was described. The heart acted as a pump, forcing the arterial blood into the general circulation and the venous blood through the lungs to be oxygenated. All the fluid ingested is absorbed into the circulation and carried by the veins to the right side of the heart. If the influx by the veins is too great and cannot be eliminated in the usual time, then it piles up in the right ventricle of the heart and causes disorders in the circulation and the most serious consequences to the organism. The proportion of the weight of the blood to the total body weight is as 1 to 13. A person, therefore, who weighs 170 pounds possesses about 13 pounds of blood. If, from time to time, one-half or one-third of the weight of the person's blood (by the absorption of the beer consumed) is suddenly added to the right heart dilatation and hypertrophy must in time follow. This over-work would be much greater if there was any organic imperfection in the heart itself, such as valvular disease or fatty degeneration, etc., or if the lungs were not healthy, as in emphysema, chronic interstitial pneumonia, etc.

In Munich it is not uncommon for people in the evening, in two or three hours' time, to take from six to eight pints of beer, and during the day from twelve to twenty pints. Working brewers take from thirty-six to forty pints. This enormous quantity of beer absorbed into the circulation is eliminated from the system only after the greatest heart

effort, this effort producing dilatation, especially of the right ventricle.

As to the bearing of this fact upon life insurance, he said that many of the helpers in breweries were young, strong, healthy men, sons of robust parents, educated in schools where gymnastic exercises are commenced at an early age, brought up on black bread, pork, sausages, beans, peas, etc. They can stand the abuse of beer for fifteen or twenty years; but by that time they become bloated, heavy and affected with many disorders, so that they are unfit to continue the business and are obliged to seek other employment. The ease with which other employment is obtained in America makes it difficult to secure accurate statistics; but, as the disorders induced by beer drinking increase every year, life insurance companies should take risks on such men only on short endowments and not at advanced ages. There were, of course, some exceptions to this rule and much depended upon the honest report of the examiner. In conclusion he said that the moderate use of wine or whiskey was not deleterious, but that beer—on account of the large quantity consumed and its mechanical effect—was the most injurious of all alcoholic beverages.

A discussion followed and a vote of thanks was extended Dr. Bernacki for his valuable paper.

Drs. Grant, Huntington, Shepherd and Winston submitted statistics showing the experience of their respective companies in regard to the increased mortality caused by the late epidemic of Influenza.

SECOND ANNUAL MEETING.

The Second Annual Meeting of the Association was held at the office of the Mutual Life Insurance Company, in New York, on May 29th, 1891, the fol-

lowing being present: Drs. Barrows, Bisbee, Bernacki, Brannan, Curtis, Davis (G. P.), Davis (W. B.), DuBois, Fisher, Grant, Hamill, Holden, Huntington, Lambert, Munn, Russell, Storrs, Thorburn, Tabb, Van Wagenen, Webb, Wells, Wilkins, Winston, Wistar and Wood.

In the absence of Dr. Keating, Dr. G. W. Russell presided.

The announcement was made that W. R. Gillette, formerly Medical Director of the Mutual Life Insurance Company, having been appointed its General Manager, had resigned from the Association.

A letter was read from Dr. J. M. Keating, resigning his position as President of the Association on account of continued ill-health, and expressing his deep and lasting interest in its welfare. His resignation was accepted with the following resolution: "That it is with great regret that we have been called upon to accept the resignation of Dr. J. M. Keating as President of this Association; an Association which he has so successfully founded and in which he has always taken the warmest interest. That we express our sincere sympathy for him in his impaired condition of health, which it is our earnest hope may be speedily restored." (The above resolution was duly transmitted to Dr. Keating, and a feeling reply of thanks received in return.)

The following gentlemen were elected to membership:

Dr. E. J. Marsh, of the Mutual of New York.

Dr. Wm. T. Bacon, of the Connecticut Mutual of Hartford, Conn.

Dr. Geo. S. Stebbins, of the Massachusetts Mutual of Springfield, Mass.

The following officers were elected for the ensuing year:

PRESIDENT.

DR. FRANK WELLS.

VICE-PRESIDENTS.

DR. G. W. RUSSELL. DR. LEWIS McKNIGHT.

SECRETARY.

TREASURER.

DR. E. J. MARSH.

DR. J. W. BRANNAN.

EXECUTIVE COMMITTEE.

DR. EDGAR HOLDEN.

DR. HENRY TUCK.

DR. E. W. LAMBERT.

DR. G. S. WINSTON.

Interesting statistics relating to life insurance were read by Dr. Hamill.

Dr. Wm. B. Davis read a paper on

“ALBUMINURIA IN PERSONS APPARENTLY
HEALTHY, AND A CONSIDERATION
OF ITS RELATION TO LIFE
INSURANCE.”

Referring first to its frequency, he called attention to the fact that Prof. Grainger Stewart has demonstrated the presence of albuminuria in nearly one-third of the population, Stirling in 44 % of healthy persons, Capitan in 45 %, De la Celle-Chateauberg in 76 % to 100 %, and Posner in all normal

urine. If albuminuria prevails so widely as among even from 20 % to 30 % of the population, it is important to ascertain the cause.

CAUSES OF FUNCTIONAL ALBUMINURIA.

Referring to Mahomed's statement, that "although a large amount of attention has been devoted to the experimental investigation of the pathology of albuminuria during recent years, our knowledge of it remains very incomplete and, owing to the contradictory results that have been recorded, what little knowledge we possess appears uncertain." He arranged the causes which have been reported as producing it under the following heads:

- 1st. Dietetic;
- 2d. Cold and cold baths;
- 3d. Muscular efforts, and
- 4th. Mental strain and strong mental impressions.

Dr. Russell, of the *Ætna Life*, had given him an illustration of the first group in the case of a gentleman, now and always in good health, who had for years found albumin in his urine after eating buckwheat cakes.

Dr. Batten had found albumin in the urine of four young men after a long ride in a cold railway car, and Dr. Lambert, of the *Equitable Life*, had called attention to the influence of extremes of temperature: "When the temperature reaches zero or below, or ninety degrees or above, the percentage of apparently healthy persons having albumin in their urine increases from 2 % to 5 % until the temperature rises or falls nearer to the mean."

With regard to muscular effort, Pavy found albumin with hyaline and granular casts in the urine of the pedestrian Weston one hour after completing one hundred and fifteen miles in twenty-four consecutive hours. Twelve hours later the urine was normal.

Dr. Wells, of the *John Hancock Life*, reports a strong, healthy man, whose urine always contained albumin after taking a boxing lesson.

As to the fourth group, Johnson reports a number of cases of temporary albuminuria as a result of the fatigue and anxiety of prolonged examination for the civil service, and Ralfe similar cases occurring among the students reading for examination.

Among other causes, Dr. Thorburn, of the North American Life, mentions excessive smoking as a factor; Dr. Thomas Bryant, a case of floating kidney, and Dr. Eustis, also a case of floating kidney, in which movement, however easy, caused albuminuria. Dr. John Mason reports a case of albuminuria occurring only at night and dependent upon the position of the body. If he lay on his back or right side, there was only a trace; if on his left side, there was an abundance of albumin, and if on his belly, there was none. Sir Wm. Roberts mentions oxaluria as an undoubted cause, and Moxon and Collins attribute it largely to morbid matters in the urine, particularly oxalate of lime. Semmola thinks it is caused by the presence in the blood of albumins of greater diffusibility than normal.

Dr. Barr says that the circulation, rather than the kidneys, is at fault, a weak propulsive power of the heart, deficient vascular tone and increased stasis from diminished blood velocity. The question of functional albuminuria was largely one of physics. Bartels and Maguire hold the same view. Goodheart reported thirty-nine cases without obvious disease. He says: ". . . , they cannot be due to nephritis. The curious intermission in the output, the suddenness with which it will come and go, is such that one may well find a difficulty in attributing it to local conditions, and least of all to anything inflammatory, for no inflammation, *per se*, could explain it." It may be due to "congestion of the viscera, over-concentration of urine, oxaluria, hæmoglobinuria, the admixture of albuminous products in the lower passages after the urine has passed the secreting structures and neurotic conditions." Senator believes there are two sources of it, one being in the blood of the capillaries of the glomeruli, and the other source in the capsule of Bowman down to that of the urethra. He believes that the desquamation and disintegration of the

urinary tract adds albumin to normal urine. The chief source of albumin in the vast majority of "Physiological Albuminuria" is probably the blood of the glomeruli, and naturally depends upon the quality of the blood as well as the pressure and rapidity of the flow through the capillaries of the glomeruli.

While some of the above-mentioned causes are exceptional, and others temporary, the greater number are, as Senator has recently said, influences which act on the majority of mankind with regular changes within every twenty-four hours; hence albuminuria, depending upon them, may appear and disappear with marked regularity within the same period.

DIAGNOSIS OF FUNCTIONAL ALBUMINURIA.

Dr. Davis proposed to simplify discussion by excluding persistent, continuous albuminuria, and albuminuria associated with any apparent disorder of the kidneys or any disturbance of general health.

Quoting Pavy, "Functional Albuminuria is the 'Generic,' and Cyclic Albuminuria is the 'Specific,' group contained within it. The distinguishing character is that, without evidence from other sources of the existence of renal disease, albumin, under the ordinary course of daily life, is at one period of the day present and at another absent, and that it recurs day after day in exactly the same order. At the period of rising in the morning there is no albumin present. In an hour or two albumin appears in increasing quantity for awhile, and then, as the day advances, declines and entirely disappears before bedtime." Pavy thus gives the profession in unequivocal terms a clean-cut description of the distinguishing characteristics of that form of functional albuminuria to which he has given the name of "Cyclic."

Senator says functional albuminuria must not contain more than one twenty-fifth to one twentieth per cent. The urine must be normal in quantity, specific gravity, and especially must be free from morphotic elements.

Tyson, Harley and others express the opinion that al-

buminuria is less significant when the specific gravity is high. Above 1020. the assumption is that it is functional.

Huebner recently reported fifty-six cases of cyclic albuminuria, and formulates the following conclusions:

(1) Cyclic albuminuria is a peculiar and especial form of persistent secretion of albumin by the kidneys.

(2) It is not dependent upon a disease of the tissues of the kidneys.

(3) It is peculiar to a certain period of development of the organism.

(4) It is provoked by a change from the horizontal to the upright position; then, lasting a longer or shorter time, it disappears even with the upright position the same day.

(5) It is merely an expression of a general weak state of the organism, which at the present time cannot be more clearly explained.

(6) Its prognosis is good, provided the patients receive proper attention.

Sir William Roberts describes albuminuria in the apparently healthy: "The albumin is usually small in quantity. Its recurrence is intermittent—absent in the morning after the rest and fasting of the night, and present during the day. It comes and goes on successive days. It contains no deposit of urinary derivatives, but sometimes a few hyaline casts are discovered (Moxon and Furburger). In other respects it is normal. There is never any dropsy or other collateral sign of Bright's disease."

The absence of albumin on rising in the morning goes, in Tyson's opinion, towards establishing its functional character.

Janeway says that a distinguishing characteristic is its presence in the daytime and absence at night.

Ralfe says that, in functional albuminuria, the correspondence between the fluid ingested and that cast out of the body follows the ordinary physiological law.

SIGNIFICANCE OF TUBE CASTS.

Some prominent writers regard the presence of tube casts in the urine as indicative of structural disease of the kidneys;

others, that a few casts, particularly hyaline, are not indicative of organic disease.

Johnson says that small hyaline and epithelial casts are often present in the albuminous urine of patients whose speedy recovery may be confidently predicted.

Edes says, "A few casts may accompany a very slight amount of albumin and have no meaning."

Janeway mentions a man whose urine contained casts only after boxing, and adds, "It follows that hyaline casts may appear in the urine, quickly formed and as quickly disappear."

Saundby, referring to a few hyaline casts with oxalates, says, "As we know, they are of no pathological significance."

Lambert, of the Equitable Life, says that he is convinced that the presence of occasional casts does not necessarily imply destructive or permanent disease of the kidney.

Grainger Stewart observed, in what he calls "Paroxysmal Albuminuria," sudden and copious occurrence of albumin in the urine with numerous casts, the process lasting only a short time and recurring at intervals." He has never known them to be permanently injurious.

Bartels mentions a case where there was epithelium and a quantity of thick hyaline casts with epithelial cells from the renal tubules, and that after the third day no casts could be discovered.

Allchin says the fact that casts are abundant in any samples of urine is not in itself of necessity a serious sign.

Harley thinks the specific gravity of much more significance than the quantity of albumin or of casts.

PROGNOSIS.

George Johnson has known cases of intermittent albuminuria to make a good recovery. One case persisted for thirty years before a fatal termination. As to prognosis, he says, "The absence of albumin at any period of the twenty-four hours, the urine being otherwise normal, warrants the conclusion that there is no serious structural change in the kidneys and justifies a hopeful prognosis."

Grainger Stewart says, "So considerable a portion of my cases have gone on for long periods without having terminated in structural disease, that I am confident that it must be rare when they have such an ending." He gives a hopeful prognosis if the quantity of urine is normal, pulse and heart normal, and if there are no tube casts.

Prof. Saundby says, "I have seen scores of cases of functional albuminuria and I have not heard of one of them developing into Bright's disease. Many of them are known to be quite well."

A recent editorial in the *British Medical Journal*, referring to this form of albuminuria, says, "It may, however, be taken as certain that the albuminuria does not pass into Bright's disease."

Edes, referring to some cases which he had followed for years without symptoms, says, "In many the albumin has disappeared without treatment."

Mahomed says, "I am quite convinced that we have albuminuria with practically healthy kidneys."

Klemperer says that "Cyclic albuminuria exhibits no signs of Bright's disease. Indeed, all symptoms except albuminuria may be absent. . . . It does not become transformed into serious disease of the kidneys, and it may finally greatly diminish or disappear entirely."

George Harley says that ". . . the specific gravity of the urine was a far more reliable guide to prognosis than either the quantity of the albumin or the tube casts."

Huebner-Schmidt's *Jahrbucher*, 1890, says that the prognosis of albuminuria is good provided the patient receives proper attention.

Pavy says prognosis is favorable where a notable amount of albumin is found at one period of the twenty-four hours and none at other periods and no symptoms of renal disease present.

Sir Willam Roberts says, "The prognosis is favorable . . . a sensible albuminuria is of much commoner occurrence in healthy persons than has been hitherto supposed."

Senator holds that normal urine may contain albumin.

ALBUMINURIA IN LIFE INSURANCE.

Dr. Davis went on to say that all that had already been said had been from the standpoint of a physician. He wished now to consider the subject from the standpoint of the Life Insurance Medical Directors, who, on account of their official relations as the advisers of large business interests, must guard those interests especially. He concurred in Pavy's statement that albuminuria occupied the position of a border line, with a favorable outlook on one side and a serious one on the other.

In 1889, at the annual meeting of the British Medical Association, this same subject had been discussed. Fifteen distinguished physicians took part; five of them favorable to the acceptance of albuminurians otherwise apparently healthy, another five favored postponement until the albumin had disappeared—only two were in favor of outright rejection.

Pavy said that medical knowledge is at present not in a position to enable us to differentiate these cases from those which may become developed into well-marked Bright's disease.

Johnson favored their acceptance at an advanced premium.

Saundby thought "the companies should relax their hard and fast rule of rejecting or deferring all albuminurians . . . they might be very well insured for five years with the condition that at the end of that time they should submit themselves for re-examination. . . ."

Tyson says that life insurance associations should recognize functional albuminuria out of consideration for their own interests as well as in justice to a numerous class.

Grainger Stewart says that the existence of albuminuria is not of itself sufficient ground for rejection.

Goodheart says that in a young person albumin in the urine which does not persist in subsequent examinations, is unimportant; but, if it does persist, or if it reappears frequently, it is a grave symptom.

Rabagliata said that the average age at death of persons with albuminuria was fifty-seven years. He therefore pro-

posed that where only a trace of albumin was present and no casts and no other definite lesion, the life might be received as one having an expectation of attaining its fifty-seventh year.

Pollock, in his Medical Handbook of Life Insurance, says, "Albuminuria persistently existing, and known to have existed for years in persons in otherwise perfect health and with good family history, may be assured for a short period of five years with an additional premium and come up again for examination at the end of that period."

The Medical Officer of the Provident Life of London says that he exceptionally accepts cases of albuminuria, but as "under average lives," provided there is a clear evidence of periodicity, (1) as to absence of albumin at some period, and (2) of varying amounts of albumin at others, the entire absence of casts and evidence that the life has never suffered from any disease of the urinary organ or of the vascular system, and that the proposed life is a young subject.

Dr. Davis called attention to this large amount of evidence that albuminuria is not at all infrequent among persons apparently healthy, and that the so-called functional albuminuria does not necessarily end in Bright's disease. If the conclusions toward which these investigations are pointed are correct, then our attitude as medical officers is wrong and we are doing injustice to a large class of people by excluding them from the benefits of insurance, and at the same time are doing the companies an injustice by advising them against a class which they might otherwise accept. He pointed out that it was only in recent years that life insurance companies had required an analysis of the urine. We find now only fifty per cent. of the companies require it in all cases, and one-half of that number have only required it for the past five years. The remaining fifty per cent. require it only when the candidate is forty-five years of age or over, and when the amount applied for is \$5,000 or over. It was, therefore, safe to assume that one-half of the persons assured during the past eight or ten years did not have an examination of their urine made, and practically all who were assured before that period

were not subjected to a urine examination. If albuminuria among persons apparently healthy is but the forerunner of renal disease, and if one-third of the population has albuminuria, we would be justified in expecting a heavy mortality from Bright's disease, particularly among those who were assured without an examination of urine. As a matter of fact, the mortality from Bright's disease among the American companies for the last five years had been but 5.66 %. Hence Bright's disease did not account for but a fraction of the albuminuria cases met with.

A recent investigation of the medical officers of one of the largest companies represented in our Association shows that Bright's disease does not account for more than 17 % of the cases of albuminuria met with at the home office. The years 1877, 1878, 1879 and part of 1880, show a total rejection of 137 persons for albuminuria. Of that number 57 had died, 11.6 % of them from Bright's disease and 5.84 % from heart disease. Crediting all of these to Bright's disease, we have at the utmost 16.9 %.

The evidence of the last fifteen years goes to show that albumin may be found in the urine of persons otherwise healthy, and that cases of albuminuria do not all end in organic disease of the kidneys. We shall be warranted in accepting the following rules for guidance in the consideration of candidates for life insurance having albuminuria, namely:

GENERAL RULES.

(1) There should be nothing in the family history indicative of heredity of Bright's disease, and there should be no symptom of renal disease in the personal history except albuminuria.

(2) The candidate should be under forty years of age, in good health, and there should be no history of gout, rheumatism, syphilis, lead poisoning, nephritis, intemperance, chronic dyspepsia or dropsy.

(3) There should be no indication of hypertrophy of the heart or increased arterial tension, no accentuation of the aortic second sound, and no palpitation or dyspnoea.

- (4) There should be no retinal changes.
- (5) The color, density and quantity of the twenty-four hours' urine should be normal, or it may be darker in color and heavier in density.
- (6) The specific gravity of the twenty-four hours' urine should not be below 1.020. It may range from 1.015 to 1.030.
- (7) The precipitated albumin should not exceed one-eighth of the urine.
- (8) There should be a period of twenty-four hours when the urine is free from albumin.
- (9) The urine, as a rule, should contain no tube casts. When, however, the specific gravity and quantity of urine are normal, the presence of a few hyaline casts has no serious import.

If the above conditions have been met, the medical examiner being a man of ability, we can safely approve the candidate for a term endowment. This, again, will doubtless appear illiberal; but until the clinical significance of albuminuria in persons apparently healthy has been finally determined by observation upon one full generation, we cannot, and probably ought not to, expect life insurance companies to do anything better for them.

DISCUSSION OF THE PAPER.

This paper was then discussed by members of the Association, as follows:

Dr. Frank Wells, after a review of his experience, formulated his conclusions as follows: "While we cannot definitely affirm that all albuminuriacs are uninsurable, any more than we can state that all applicants with adverse family histories will prove to be bad risks, yet it is only prudent to continue to consider them, as a class, impaired lives until science has more clearly proved that albuminuria may be physiological and hence under certain conditions not a bar to insurance."

Dr. Huntington said that his advice to his own company would be not to make any change in the present method of treating these cases, and that he preferred to retain this attitude toward them until an amount of statistics had been accumulated sufficient to show exactly how much these lives were impaired.

Dr. Hamill said that he did not agree with the statements made by some of the authorities quoted by Dr. Davis, that albumin was present in from twenty to fifty per cent. of all persons. He did not believe that experience in private practice would verify that opinion, and it certainly was not borne out by life insurance examinations. He also called attention to the remarkable fact that many persons in whom Bright's disease was made out by the practitioner continued to live many years afterward in the enjoyment of good health. The conclusions arrived at by Dr. Davis, the general rules formulated by him, seemed to Dr. Hamill to be replete with sound, hard, common sense.

Dr. Thorburn expressed the opinion that upon business grounds we are justified in accepting albuminurics only under very exceptional circumstances.

Dr. Webb felt confident that a certain proportion of cases of albuminuria were safely insurable on some plans; but the difficulty was to distinguish those which were insurable from those which were not. The only course left open, he thought, was not to accept until a long period of time had passed without albumin being found.

Dr. Van Wagenen called attention to an interesting case where albumin had been found by a life insurance company in a case which he had examined only a short time before and had advised to apply for insurance, the urine being free from albumin. After careful study of the case he found that the urine was free on Monday after the rest of the preceding day, but was present during the exertion of week days, and he urged concerted action by the companies to avoid the demoralization which would otherwise occur among the agents.

Dr. Wilkins, after referring to a case of albuminuria which had extended over a period of twenty years in an otherwise

healthy man, expressed the opinion that these cases were insurable, and it was a question of selecting the proper plan or charging a suitable premium.

Dr. Barrows felt that sufficient knowledge had not yet been accumulated to enable us to insure these risks, and the difficulty now was properly to differentiate those which were safely insurable from those which were not.

Dr. Storrs emphasized the difficulties of determining the real nature of these cases of albuminuria, and of recognizing whether the case is functional or structural in character. He called attention to the results of post-mortem examinations where Bright's disease was found which did not show itself before death by any trace of albumin, by casts or by specific gravity. He referred to a case of Bright's disease which apparently recovered, regained his flesh and considered himself well, but was taken with a slight cold and died suddenly. Post-mortem showed small contracted kidneys. He therefore should always feel that if he had albuminuria it was a precursor of Bright's disease.

Dr. Lambert said that he did not believe in physiological albuminuria, nor did he believe in cyclical albuminuria. He mentioned a case of typical, so-called cyclical albuminuria in a well-nourished, fine-looking man. Before twelve o'clock you never found albumin. Between twelve and five you always found it, and in the evening it again disappeared. Five years later he died of apoplexy with chronic Bright's disease. That was Dr. Lambert's first experience with cyclical albuminuria. Another case seemed to be one of physiological albuminuria. After repeated examinations, in which only a trace of albumin was found, it was decided to accept the man. He died in just two years of Bright's disease. Another case examined at the same time (a partner of the case just mentioned) had shown profuse albuminuria in the first examination. That man was still living after a period of twenty years. "We made a bet on the wrong horse." The question in his opinion is broader and deeper than the mere question as to what the subjects will die of. "Albuminuria is an indication of something wrong with the

physical condition of the individual, and is the red flag of danger." He was willing to admit that there were cases where albuminuria means no more than cold in the head, and to admit that there are many cases where subjects live on in spite of albuminuria; but he had not yet discovered any means by which to distinguish between the case where the subject is going to live and the one where he is going to die early. Of all cases in which albuminuria had been found by him between 1877 and 1888, forty per cent. had died. Unless, therefore, he could satisfy himself that there was some temporary, passing condition to induce this albuminuria, he felt very much afraid of it. He said that excessive cold or heat, some forms of indigestion and other passing influences, may produce temporary albuminuria. The difficulty is to decide which condition is before you at the time of the examination, and that for himself he felt that he was in as much of a fog now as he was sixteen years ago.

Dr. Curtis's opinion was exactly that of Dr. Lambert. Their experience had been identical and they had come to the same conclusions.

Dr. Holden raised two questions, the first: "How are we to be sure in any case which involves the difficulty of distinguishing between the harmless albuminuria and the serious?" and the second: "Are our examiners competent in so important a matter?" Referring to the latter question, he spoke of the difficulty in securing the highest kind of medical talent in the large mass of business throughout the United States, and that if we endeavor to decide in each individual case whether it is a temporary cyclical albuminuria or not, we should expose ourselves to a perhaps incalculable danger. He referred to the following case: An applicant then thirty-seven years of age was found, on examination by one of the best men in the West, to have a slight trace of albumin. Three out of the five subsequent examinations showed albuminuria and the man was postponed. Recently the same examiner made repeated examinations, found no albumin, and the risk was accepted. The man died three months later of Bright's disease. This case showed the difficulty of de-

ciding this class of risks, as the examiner was of high reputation and known ability, and probably believed in cyclical albuminuria.

Dr. Tabb agreed entirely in the opinion expressed by Dr. Wells, and said that, like Dr. Lambert, "he was as much in the fog now as before."

Dr. Winston mentioned a study of cases made by him during 1876, 1877 and 1878, in which twenty-nine cases were known to be living in apparent good health. Seventeen had died of heart disease, five died of apoplexy and three of probable Bright's disease. Other cases of this group he had been unable to trace. It will thus be seen that nine cases of the seventeen died of probable Bright's disease. In his opinion, persistent albuminuria rendered a risk unacceptable; but, where repeated examinations showed that this was but transient in character, it was not to be considered an absolute cause of rejection. This was particularly so if the specific gravity of the urine was good and accompanied by satisfactory microscopical examinations. It was his custom, in cases where a slight trace of albumin had been found on a single occasion, to make three or four examinations, one or two of them microscopical as well as chemical, and if all were found free from albumin he then thought it safe to issue a policy for a small amount.

Dr. Grant said that he was in accord with the general census of opinion regarding the signification of albumin in the urine. He thought cases of albuminuria should be postponed.

Dr. Wistar said he could not understand or account for the statistics of some authors cited by Dr. Davis, showing albumin to be present in a large proportion of cases. It did not coincide with the results of his observation. Of the persons examined by him not more than six to eight per cent. showed any trace of albumin in the urine. He called attention to the difficulties of reconciling the views of the profession at large with the views of life insurance examiners. "Their first obligation," he said, "is to the patient or applicant—ours to the company; theirs to impart hope and encouragement to

the subject—ours to guard the interests of the company that employs us and trusts to our judgment.” He therefore paid little attention to the opinions of experts in such cases, and said that medical officers should not be guided by the opinions of the authors quoted by Dr. Davis.

Dr. Wood thought that the rules laid down in Dr. Davis's paper would be a good guide by which to form a reasonably correct opinion as to the clinical significance of albumin in cases in private practice; but as medical directors the question assumed additional importance. Not one of the gentlemen who had spoken was willing to assume the responsibility of advising his company to issue a policy in any form of persistent, or even intermittent, albuminuria. He called attention to Dr. Lambert's statement that we are not yet able to differentiate the simple cases from those which will eventually terminate in organic disease of the kidneys. Besides he (Dr. Lambert) had shown that those persons who have had albuminuria are, as a class, not good risks; though they may not die of kidney disease, they do not live out their expectation in life. That, in Dr. Wood's opinion, is a very important factor.

Dr. Brannan said that we should not forget that albuminuria is always pathological. It shows some disturbance of the nutrition of the glomerular epithelium. It may be only temporary, but, if unchecked, it leads to structural change of the renal tissue. The significance of the albuminuria should be determined in each case, whether due to changes in the composition of the blood, or in the blood-pressure or rate of flow, or to organic disease of the kidneys. If due to temporary causes, and the renal tubules are in good condition, as shown by normal specific gravity and a daily excretion of from twenty-five to thirty grammes of urea, *immediate* prognosis is favorable. A distinction should be made between the *immediate* prognosis and the prognosis as to the ultimate termination of the case. The specific gravity is a guide to the former, but not necessarily to the latter. If albumin continues to pass through the glomeruli, the tubules will also surely suffer in time. Those who hold that the

prognosis of intermittent albuminuria is good base their opinion on the understanding that the condition is recognized, treated and relieved. As physicians we can accomplish this because we can control our patients; but as medical officers of life insurance companies we usually lose sight of the individuals in question as soon as they obtain their policies. He referred to two cases, the first illustrating Semmola's theory of the dyscrasic origin of albuminuria due to the presence of diffusible or foreign albumin in the blood. A merchant, aged fifty-one, of good record and physical appearance, trace of albumin. The applicant stated he was accustomed to eat three raw eggs daily for breakfast. Several months later, after abstaining from eating eggs during that time, repeated examinations of the urine gave negative results. This was five years ago and he is still alive in apparently good health. Whether the albumin found in the urine was unchanged egg-albumen or serum-albumin from the blood, he could not decide. He thought it probable that there was as yet no histological change of the epithelium of the glomeruli such as Semmola states results from the long-continued passage of diffusible albumins. The second case was a broker, aged forty-one, of fine, healthy appearance and perfect record. Trace of albumin was found in one examination out of eight, extending over a period of several months. Six months later he committed suicide by morphine. The autopsy showed marked vascular injection of the glomeruli; epithelium of convoluted tubules contained a small amount of fat in minute but distinct drops; the glomerular capsules thickened by fibrous tissue in concentric layers; here and there small areas of round cell infiltration. The diagnosis, as regards kidneys, was "A slight degree of chronic nephritis." The specific gravity was always above 1.015.

Dr. Brannan pointed out that one feature characterizes all of the different kinds of albuminuria not obviously dependent on organic disease, namely, intermittency in the appearance of the albumin in the urine; but pathological albuminuria is also sometimes intermittent, especially in the

more serious form of granular kidney. Hence this sign alone is not sufficient for a positive diagnosis. In fact, Lécorché and Talamon, as a result of their extended pathological studies, state that Bright's disease in all its forms develops as a rule intermittently by acute periods of inflammation interrupted by remissions more or less complete. The remission may last for years; the albuminuria may even entirely disappear, a fact to be explained by the cicatrization of the lesions of the glomeruli and their complete atrophy. It is not improbable that albuminuria may be due in some cases to small localized foci of nephritis. The above observers believe it is often caused by glomerulitis limited to a few glomeruli at a time.

Dr. Munn, in looking over the records of the company with which he was connected, found that ten per cent. of all deaths were from Bright's disease. In cases examined by himself he found albuminuria with no discoverable cause for its existence in twelve per cent. of those cases. He had watched those cases ever since, and now has under observation nearly one hundred and fifty. He had come to the conclusion that there were many persons with albuminuria who go on and live long enough to insure them, but they are a very small part of the cases of albuminuria we see. As a class they are bad risks. They do not all die from Bright's disease, but, as Dr Lambert had said, "They die," and so many of them die that as a class we cannot afford to insure them. He emphasized the difficulty of distinguishing those who were insurable risks from those who were not, and pointed out that it would be necessary to follow up the cases for a long time before we should be able to arrive at a conclusion.

Dr. Russell pointed out the difficulty of securing perfectly reliable examinations of applicants, not only in the matter of urinary analyses but in the physical diagnosis as well. It led him more and more each year to distrust examinations made by certain persons, though this could not be helped. He was inclined to rely more and more upon certain facts stated in the application and usually correctly stated—the

height, the weight, the age, the ages of relatives, living or dead, and the causes of death. These he felt were the most reliable data we had to deal with.

Dr. Huntington referred to a record of all examinations made during the preceding fifteen months at his office. He called attention to Dr. Lambert's remark referring to atmospheric and other conditions, and compared three months in 1890 with three months in 1891. In the former the percentage was five, six and seven per cent. respectively, whereas in the latter the percentage was thirteen, ten and nine respectively. This increased percentage in 1891 was apparently due to the grip and showed the influence of that factor on the appearance of albuminuria. Out of the total of fifteen months the average percentage was a little over six per cent., and in his opinion this was a fair average for cases examined in New York City.

In closing the discussion, Dr. Davis said that it had elicited the fact that we know little concerning the clinical significance of albuminuria. For fully fifty years the profession were led to regard albuminuria as an almost invariable symptom of Bright's disease; but we now know that many agencies are factors in the production of albuminuria which have no connection with structural disease of the kidneys. Since coming to the city he had learned what a potent factor the present epidemic, the grip, had been in producing albuminuria in persons who gave no outward manifestations of its influence and who regarded themselves as in good health. One large company had found an increase of over one hundred per cent. in albuminuria, another had found albuminuria in thirty-seven per cent. of the persons examined, whereas the average was but six per cent. He emphasized also the fact that we may have Bright's disease without albuminuria, and referred to a paper recently published in the *New York Medical Journal* by Dr. Purdy from Guy's and other hospital reports. In a record of over three hundred deaths seventy-five per cent. did not have albuminuria during their last illness. He concluded by saying that, if we will keep all the cases of albuminuria under observation

which are reported to us and learn what finally becomes of them, we shall some time in future be able definitely to answer the question, "What is the clinical significance of albuminuria in persons apparently healthy?"

A vote of thanks to Dr. Davis was then passed for his very scientific paper.

THIRD ANNUAL MEETING.

The Third Annual Meeting of the Association was held at the office of the Mutual Life Insurance Company in New York, May 27th. 1892. There were present: Drs. Bacon, Bernacki, Bisbee, Brannan, Chatard, Curtis, Davis (C. W.), Davis (G. P.), Fisher, Foster, Gage, Grant, Hamill, Huntington, Lambert, Marsh, Paddock, Rex, Scott, Shepherd, Tabb, Toulmin, Tuck, Van Wagenen, Wells (Frank), Wells (G. W.), Wilkins, Winston, Wood, Young.

Dr. Keating was elected an Honorary Member of the Association.

The following gentlemen were elected to membership in the Association: Dr. F. E. Chatard, of the Maryland Life; Dr. Clark W. Davis, of the Union Central; Dr. J. Allison Scott, of the Penn Mutual; Dr. H. Toulmin, of the Penn Mutual; Dr. G. W. Wells, of the Manhattan; Dr. G. M. White, of the Mutual.

Fourth Annual Meeting.

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The following officers were elected for the ensuing year:

PRESIDENT.

DR. FRANK WELLS.

1ST VICE-PRESIDENT.

DR. J. W. FISHER.

2D VICE-PRESIDENT.

DR. H. CABELL TABB.

SECRETARY.

DR. E. J. MARSH.

TREASURER.

DR. J. W. BRANNAN.

EXECUTIVE COMMITTEE.

DR. EDGAR HOLDEN.

DR. HENRY TUCK.

DR. E. W. LAMBERT.

DR. G. S. WINSTON.

FOURTH ANNUAL MEETING.

The Fourth Annual Meeting of the Association was held at the office of the Northwestern Mutual Life Insurance Company, Milwaukee, Wis., on June 6th, 1893. There were present: Drs. Chatard, Davis (C. W.), Fisher, Foster, Hamill, Marsh, Pad-dock, Russell, Shepherd, Storrs, Tabb, Thorburn, Webb, Wells (Frank), Wistar and Young.

The minutes of the last meeting and of the Executive Committee were read and approved.

The following gentlemen were elected to membership:

Dr. R. J. Blanchard, of the Great Western Life.

Dr. S. H. Carney, of the New York Life.

Fourth Annual Meeting.

Dr. F. W. Chapin, of the Home Life.
 Dr. H. Chown, of the Great Western Life.
 Dr. M. L. King, of the New York Life.
 Dr. O. H. Rogers, of the New York Life.
 Dr. E. K. Root, of the Connecticut Mutual.
 Dr. T. H. Willard, of the Metropolitan Life.

Drs. Gillette and Tuck were elected Honorary Members of the Association.

The following officers were elected for the ensuing year:

PRESIDENT.

DR. FRANK WELLS.

1ST VICE-PRESIDENT.

DR. J. W. FISHER.

2D VICE-PRESIDENT.

DR. H. CABELL TABB.

SECRETARY.

DR. E. J. MARSH.

TREASURER.

DR. J. W. BRANNAN.

EXECUTIVE COMMITTEE.

DR. EDGAR HOLDEN. DR. G. R. SHEPHERD.
 DR. E. W. LAMBERT. DR. G. S. WINSTON.

The death of Dr. William B. Davis, of Cincinnati, Ohio, a member of the Association, and Medical Director of the Union Central Life Insurance Co. having been announced to the Association, the following resolutions were placed upon the minutes:

"It is with profound sorrow that the National Association of Life Insurance Medical Directors has learned of the death

of its late associate, W. B. Davis, M.D., of Cincinnati, formerly Medical Director of the Union Central Life Insurance Co.

"The deep interest which he took in all branches of his profession caused him very early to throw his great energies into the establishment of this society, whose welfare he did so much to promote.

"His courtesy to all his associates, his geniality in social intercourse, and his marked ability as a Medical Director, endeared him to all; and his loss will be sincerely felt, both as a companion and as a trusted adviser.

"The deep sympathies of this society are sincerely tendered to the members of his bereaved family, for whom we desire to express a sentiment of great respect.

"To the Company which by his death has been deprived of the services of a valuable officer, we most respectfully express our sorrow at the great loss which it has sustained."

The death of Dr. Frank Donaldson having been announced, the following expression of the feelings of the Association was adopted:

"It is with a feeling of sincere sorrow and with a sense of personal loss that the National Association of Life Insurance Medical Directors is called upon to record the death of Dr. Frank Donaldson, of Baltimore, formerly Medical Director of the Maryland Life Insurance Co.

"As one of the original members of the Association, he took a great interest in all that pertained to its well-being, and by his valued advice, gained through many years as a Medical Director, materially aided in its successful formation.

"His amiability and his kindness of disposition made warm friends of his associates, who sincerely mourn the vacancy which his death has created. We desire to convey to the Company in which he so ably filled the position of Medical Director, our expressions of appreciation of the loss which it has sustained, and to express to his bereaved family our sentiments of deepest sympathy."

By request of the Association, Dr. D. R. Brower, Professor of Mental Disease at the Rush Medical College, etc., read a paper on

THE RELATION OF CERTAIN DISEASES OF THE
NERVOUS SYSTEM TO LIFE INSURANCE.

He referred to diseases of the nervous system in their bearing upon the subject of life insurance from the standpoint, first, of Diagnosis, and secondly, as to the Effect of the disease on the average duration of life.

General Paresis, or General Paralysis of the Insane, is one of the most important; because, from seeming perfect health it hurls the victim to destruction with great rapidity, the process being completed in from one to three years. It is also important on account of its rapidly increasing development in the larger cities and because it selects its subjects from men in the prime of life, those especially who are engaged in occupations requiring great brain activity. The influence of heredity in this disease can be traced in thirty per cent. of the cases—not necessarily in the form of general paresis, but of an over-sensitive, easily impressionable, impulsive condition of the nervous system. Of the symptoms of this disease, usually the first to manifest itself is a condition of mind often altered in the direction of exaltation and an unusual sense of well-being with facial lines of exaltation. Sometimes the beginning is in the opposite direction; the patient is exceedingly sensitive to the effect of commonplace experience, and this great sensitiveness of the emotional nature is likewise manifested in the facial expression, which is one of mental depression. The patient also has disturbance of sleep; it may be simply by dreams or it may be complete insomnia. There is also inco-ordination of muscular movements very early in the disease, especially in the finer movements of the tongue. The tongue is protruded suddenly and is as suddenly withdrawn, and when it is protruded there is a marked twitching of the muscular fibrillæ. There is also a disturbance of articulation which is easily shown by

the attempt to pronounce the well-known sentence: "Round about the rugged rocks the ragged rascal ran." The attempt to articulate this sentence will be accompanied by considerable twitching of the small muscles of the lips and eyes. There may also be inco-ordination of the lower extremities. The patient should therefore be tested in standing and walking backwards with his eyes closed. The patellar tendon reflex is usually often disturbed. Sometimes it is exaggerated, sometimes diminished, and sometimes unequal on the two sides. The inco-ordination may begin in the upper extremities. These should also be tested. There is also a congested state of the capillaries of the face. The flushed cheeks noticed by the careful observer are not the rosy cheeks of health, but of impairment of the function of the vaso-motor system. The pupils also should be noticed. They may be contracted or dilated. They do not respond normally to light. They are unequally contracted or dilated and are usually irregular in their marginal outline. Common sensation throughout the body is diminished and the color sense, especially the faculty for recognizing blue, is often impaired. The temperature is somewhat above the normal (about 99.2°). These tests of the initial stage of general paresis are so simple as to be easily applied by the life insurance examiner. If the diagnosis of general paresis is made the risk must be rejected.

As to *Insanity*. The rule of life insurance companies to refuse patients who have once been insane is generally a very good one; yet it should not apply to all, for a recovery from insanity is often as complete as from pneumonia or typhoid fever. Each case must be judged on its own merits. Some are justly entitled to insurance. It may be wise to limit the period of insurance, but all such cases should not be rejected.

As to *Suicide*. The position taken by the majority of insurance companies, in having a clause inserted in the policy voiding the insurance of a person who dies by his own hands, is based on the idea that suicide in every instance is the act of a sound mind. This is an unreasonable conclusion, for in the majority of cases suicide is not the act of a healthy mind,

and therefore the burden of proof should lie with the company to show that the suicide was a sane act, and, unless this can be done, the policy should not be void.

Paralysis is a too frequent cause of death among policy holders. The three ordinary causes are intra-cranial hemorrhage, embolism and thrombosis, the largest number being due to hemorrhage. Embolism is usually due to valvular disease of the heart, and this condition should not escape detection. Hemorrhage and thrombosis are both the result of arterial degeneration. The degeneration which leads to hemorrhage is due to degeneration of the wall of the vessel and ought rarely to be overlooked. The examiner should carefully examine the radials, the carotids and the temporal arteries. He should also examine the eyes for arcus senilis. With these precautions and, if possible, an examination of the fundus of the eye for retinal hemorrhages, he ought rarely to fail to detect that degeneration which sooner or later produces paralysis; and, having recognized the condition, the risk should be rejected.

Epilepsy is very important in connection with life insurance, and easily overlooked by the examiner. It is often overlooked by the applicant. The nocturnal form of the disease frequently exists for years without the patient's knowing it. *Petit Mal* is also overlooked by the applicant, and may reasonably, therefore, be overlooked by the examiner. Cases of epilepsy usually have dilated pupils, of different size and irregular outline. The eyes are often of different colors. The tongue usually shows considerable fibrillary tremor. These patients are usually short in stature with cranial asymmetry, bad teeth and high palatal arch. Their ears are often badly shaped, and the fingers usually very long. Occasional attacks of nocturnal incontinence of urine are usually the result of epileptic attacks. Epilepsy should not necessarily be a cause of rejection, but should reject on the ordinary life plan. A short term is certainly perfectly safe where the paroxysms occur at long intervals. Dr. Brower would advise accepting them for short-term policies where the paroxysms are not more frequent than once in six months and of the nocturnal type.

Migraine is not infrequently associated with epilepsy. The epileptic paroxysms become attacks of migraine and vice versa, so that the pathological basis upon which they both rest must be quite similar. Its relations to life insurance should be precisely those of epilepsy. While it should not reject, yet, in Dr. Brower's opinion, the victims should be insured on short-term policies.

Three Diseases of the Spinal Cord demanded special attention. They are locomotor ataxia, ataxic paraplegia, and infantile paralysis.

Locomotor Ataxia is the most important of these from a diagnostic standpoint, and its early recognition is a matter of considerable importance. It should not entirely disqualify, but such cases should not be insured on the ordinary life plan. The first consideration, in Dr. Brower's judgment, in the early diagnosis of locomotor ataxia is the condition of the reflexes. First the pupillary reflexes. They are as a rule very early diminished or lost; but this alteration must be tested in connection with the power of accommodation. Be sure that there is no inflammation of the iris. If the pupil responds but sluggishly to the efforts of accommodation, or fails to respond under the stimulus of light, we have reason to suspect some organic disease behind it. The pupils are contracted, are dilated equally, or it may be unequally, and are often irregular in their outline. The bladder reflex is early diminished, and instead of urinating four or five times daily, they get along easily with two or three urinations in twenty-four hours. The relative frequency will easily determine any alteration in the bladder reflex. Then the patellar tendon-reflex is a very valuable aid. It is important to test this, not by striking the tendon over the clothing, but after the part has been made bare, and the cerebral influence should be withdrawn from the part by having the patient lock hands and, with his eyes closed, firmly and vigorously pull them. It is not the absence of this reflex pure and simple, but the loss of it, that is valuable as a diagnostic sign. You must be sure that the patient once had it before you can consider its absence as an evidence of disease. Co-ordination in

standing should be carefully tested. The co-ordination in locomotion should also be tested, by having the patient walk backwards and forwards with the eyes shut, inco-ordination being more frequently manifested in backward than in forward locomotion.

Ataxic Paraplegia. This disease should also disqualify from ordinary life insurance. Like locomotor ataxia, it has a very long period and should not disqualify from a short-term policy. It can usually be recognized by the exaggeration of the patellar tendon-reflex and by the slight dragging of the toes in walking and a sense of diminished power in the limbs. An examination of the shoes shows that the toes wear out first. In locomotor ataxia the heels wear first.

Infantile Paralysis, or *Poliomyelitis Anterior Acuta*, is only of interest as to its relation to longevity. It does not cut short the period of life, and there is no tendency to recurrence; and, while paralysis should diminish the value of the life a little, this is only because the person is more liable to accident by reason of the paralysis.

This paper was discussed by the members, and the thanks of the Association were extended to Dr. Brower for his interesting paper.

Dr. Hamill read a paper on the statistics of Declined Risks of the Prudential, which he had been able to follow for several years subsequent to the Company's action. The thanks of the Association were tendered to Dr. Hamill.

FIFTH ANNUAL MEETING.

The Fifth Annual Meeting of the Association was held at the office of the Mutual Life Insurance Co., in New York City, on June 13th, 1894. Present: Drs. Bernacki, Bisbee, Brannan, Burrage, Chapin, Chatard, Curtis, Davis (G. P.), Foster, Fisher, Grant,

Gray, Hamill, Holden, Huntington, Lambert, Lyster, Marsh, Morgan, Munn, Rogers, Root, Tabb, Vandewater, Van Wagenen, Webb, Wells (F.), Wells (G. W.), White, Wilkins, Willard and Winston.

The minutes of the last meeting and those of the Executive Committee were read and approved.

The Treasurer's report was read and referred to an Auditing Committee, who found it correct.

The following gentlemen were elected to membership in the Association:

Dr. Robert L. Burrage, of the Prudential Life.

Dr. James Campbell, of the Ætna Life.

Dr. John L. Davis, of the Union Central Life.

Dr. C. A. Devendorf, of the Michigan Mutual Life.

Dr. Landon Carter Gray, of the Nederland Life.

Dr. Wm. D. Morgan, of the Phoenix, and

Dr. A. L. Vandewater, of the Equitable Life.

The following selection of officers was made for the ensuing year:

PRESIDENT.

DR. EDGAR HOLDEN.

1ST VICE-PRESIDENT.

DR. J. W. FISHER.

2D VICE-PRESIDENT.

DR. H. C. TABB.

SECRETARY.

DR. O. H. ROGERS.

TREASURER.

DR. J. W. BRANNAN.

EXECUTIVE COMMITTEE.

DR. E. CURTIS.

DR. E. J. MARSH.

DR. A. HUNTINGTON.

DR. FRANK WELLS.

The death of Dr. John M. Keating having been announced, a Committee was appointed to report at the next annual meeting suitable resolutions of respect.

Dr. Hamill read a short paper on

CONSUMPTION.

He said he had set for himself the task of making an investigation into the bearing of consumption upon Life Insurance and that he had the records of some 25,000 cases of death from which to obtain details for purposes of study. He proposed to commence at death from consumption and work back, in order to determine just how much importance should be attached to family history. He invited an expression of opinion from the gentlemen present and any suggestions which might occur to them as to the best method of carrying on his work.

He made several general propositions, as follows:

- 1st. Consumption is not inherited.
- 2d. Predisposition to consumption is inherited.
- 3d. Consumption is acquired by contagion, by adverse environment, by too great exposure, by intemperate habits.
- 4th. The influence of occupations.
- 5th. Influence of heredity after the 35th year.
- 6th. Proportionately as many die after the 35th year as before it.
- 7th. One-fifth of all cases die from consumption.

In the course of the discussion which followed the reading of this paper Dr. Curtis suggested that the question of weight should be considered in future compilations.

Dr. Rogers thought that the family record was a comparatively unimportant factor. It seemed significant in only about 20 % of cases—perhaps 25 %—the key-note of the situation seemed to be the build of the individual himself. The family history is only significant in case where the build is distinctly a slender one, and then it becomes important.

Dr. Willard was of the opinion that applicants misrepre-

sent the causes of death, although they generally gave the correct age at death. The family history is represented much more in the bulk than in individual cases.

Dr. Brannan favored that method which involves a study of a large number of cases without regard to causes of death. He said that of 2000 cases examined 17 % were caused by consumption. Some 600 were free from consumptive taint in the family record, and 400 gave a record of one or both parents, a brother or a sister dying from consumption. Of 1600, 12 % of the applicants who had no record of consumption in the family still died of consumption themselves. Of the 400 who had a record of consumption in the family about 25 % died of consumption. He also referred to the subject of weight as bearing an important part in the history of the causes of consumption.

Dr. Thomas Glover Lyon, of London, Secretary of the Life Assurance Medical Officers' Association of England, spoke in very complimentary terms of Dr. Hamill's paper and of his satisfaction that the doctor's study of the subject was to be continued. It seemed to him, however, that the problem is—what is the mortality among those who give a family history of consumption?—and he felt that, by taking only those who died from consumption, the question could not be satisfactorily answered, because the experience was limited to those who died of that disease. He thought it was very probable that among those who give a family history of consumption there was a greater tendency to die from other diseases as well as from consumption. In his opinion it was important therefore to take a great number of those risks who had given a history of consumption and follow those cases up to study their longevity. In his opinion there was no other way. He thought it was important also to associate an actuary in the work, as, however well equipped a physician might be, the importance of having expert assistance was very great. He referred to the point brought up by Dr. Curtis and Dr. Rogers—that of weight. This was of great interest to him in investigating the subject in England. He had not taken that particular factor into account. He

spoke of trying to secure the interest of the older companies in studying this subject. He had not succeeded up to that time; but he hoped the discussion would make them take up the work in the future. He emphasized once more the importance of associating an actuary with a medical director in the study of these cases.

Dr. Wilkins referred to cases of consumption as being acquired and not hereditary. He recognized the predisposition to consumption in persons over 30 years of age.

Dr. Hamill said that there were so few cases where a man was able to give the actual causes of death of his grandparents that that portion of the family history was, in his opinion, of practically no importance whatever.

Dr. Brannan thought that the history of the grandparents was of some value. The question of consumptive taint in the family would be included in this information.

Dr. Lyster said that there was a certain set of men between 20 and 30 who acquired consumption entirely independently of the tendency of the family. He was convinced that a large percentage was acquired between 20 and 30 on account of exposure.

Dr. Wells thought it was an important matter to discover the longevity of the applicant's family. There were so many factors to be taken into consideration in developing this problem that we should not consider the risk from simply the standpoint of the family history. He referred to the matter of occupation, as, for example, in railroad work, in electrical work and among mill operatives. Among the first the automatic coupler, the patent pumper, etc., had greatly reduced the mortality. In the second class, so many safeguards have been thrown around the handling of electrical appliances that the risk was enormously reduced. As to mill operatives, the improvement in the mills has resulted in the fact that the danger does not now arise so much from the inhaling of particles of dust, as from the high rate of speed of the looms, requiring constant nervous effort to watch the machinery.

Dr. Curtis, referring again to consumptive family record,

said that, as we have to recognize consumption as one of the principal causes of death among the insured, he thought that the importance of the family record was specially significant when taken in connection with the weight of the applicant.

A paper was read by Dr. Holden on

THE FACTORS OF LONGEVITY.

After calling attention to the expectation of life at different ages, as given by the various tables, Dr. Holden raised the question: Why should one man with reckless disregard of all rules of health live on, while others with equally good surroundings and the utmost care of living succumb to the first illness? The truth probably is that the degree of prolongation of life depends on the individual to a great extent, and upon his ancestry to a still greater. In Dr. Holden's opinion there are but two factors of longevity: One, an inherited toughness of fibre, a tenacity of vitality—in short, inherited potentiality. The other factor is conformity to natural law.

In speaking of inherited potentiality, he referred to the researches and conclusions of Professor Weismann which, while speculative, greatly aid in dealing with any question of ancestral transmission.

Longevity demands a good foundation and due care of the superstructure. The first may give long life without the second; but the second is almost powerless without the first. The man who has inherited tenacity of life,—whose life, from the segmentation of the ovum in which he began, contained this principle of potentiality just as certainly as it did his Roman nose, square jaw or prominent eyebrows,—may disregard the law of nature, inflame his stomach with liquor, may defy the elements, inhale the bacilli of deadly disease, may have his body pierced with sword or bullet, and calmly emerge from a cyclone of disaster to start anew with a freshness and vigor simply amazing. He may be thin, unprepossessing, fragile in appearance, but regeneration, reinforcement of exuberant vitality pervades his whole system.

On the other hand, the man who lacks this inheritance may have an appearance of good health, but on the abuse of liquor he succumbs to gastritis, or cirrhosis, or Bright's disease. Exposed to the elements, he dies of pneumonia. If he inhales bacilli, the ready soil develops them in myriads, which carry him off. A wound, even in no vital part, leaves him only time to make his will. By obeying the laws of nature he may prolong his days; but, unfortunately, by the time he has learned to do so he realizes that his knowledge is the result of transgression, and the consequences handicap the remainder of his existence. Inquiry among the oldest of the Greenwich and Chelsea pensioners showed a remarkable inherited tendency to long life. While studying longevity, Dr. Holden himself made a record of over two hundred old men, one hundred and five of whom gave him reliable information as to their parents. Sixty-five per cent. of these had one, and often both, parents surviving seventy years. Forty-five per cent. had survived seventy-five years. The families were prolific, and averaged from six to seven children. The size of the families, the rarity of deaths among infants and the rarity of death from ordinary disease, showed the existence of a remarkable vigor and a persistence of vitality.

In certain families, where marriage has introduced a consumptive tendency, some of the children and grandchildren were short-lived, while some withstood the strain and possessed the resistance of vitality described. In perhaps most instances fathers transmitted to sons and mothers to daughters. This is in accord with the record of the Brompton Hospital for Consumptives. This is also true of insanity, of disease belonging to the bilious and lymphatic diathesis, but is less true of cancer, of atheroma, and cerebral or renal disease.

Inherited potentiality of life is by no means invulnerable. Repeated violations of natural laws and certain diseases, even more relentless than syphilis, will overcome it. This is shown in the history of families of hereditary criminals. The history of the Jukes family of criminals is probably one of the most appalling records of hereditary transmission of criminality

through many generations ever written. Yet, in spite of all its degradation, crime and disease, the race was shortened in individual duration of life, but was never extinguished. An example of the power of virulent disease is that of the Indian tribe of the Mandans, which, in 1838, was completely wiped out by a single epidemic of smallpox.

The first factor of longevity may be presented in another way. If you toss a ball of thin glass from hand to hand, a chance of dropping it between the first and thousandth time may be calculated with a reasonable certainty. The chance of its being broken also by the fall, both as regards the time between the first and, say, the fiftieth, and as to the number of falls before breaking, may also be estimated; but suppose the ball to be made of infrangible glass, such as was invented a few years ago, while the chances of dropping remain the same, the chances of its breaking bear a far different ratio, for it can only break if it strikes against a hard and angular object and not from the mere fall. Man in his career must often and inevitably fall; but the result is largely determined by the quality of his material. A barrel of tools with a man on top fell not long ago upon a man standing at the bottom of a mine well. The man on the barrel was killed. The man at the bottom of the well had seven ribs broken, as well as a shoulder-blade and one arm, yet he recovered completely in three months. Looking up his family record, Dr. Holden found that he had nine brothers and sisters. His father was living, aged ninety-six, and his mother at eighty-six. His brothers and sisters ranged from twenty-seven to fifty-seven. His paternal grandfather died at one hundred and four, and his father's mother at ninety. Another man in middle life during twelve years suffered frequent illnesses resulting from extreme dissipation—gastritis, pneumonia, hepatic colic, seven attacks of delirium tremens—and finally died from tertiary syphilis. His father and mother reached nearly eighty, and several sisters were still living at advanced ages. No infant child had ever died in the family. Another was for many years given to sprees and to excesses of every kind. Twenty-five years ago he had purpura and cerebral hemor-

rhage, and since then he has had almost every disease from diphtheria to typhoid fever, and neither the microbes of disease nor the strain of mania-a-potu seem to have phased him in outward appearance. Always thin and pale, the lapse of years had hardly left an impression. His mother died at eighty-two, all his brothers are still living, no deaths in childhood. These men appear to be fragile, as the glass ball, but they belong to the infrangible class.

Dr. Holden thought there was one singular feature associated with inheritance of tenacity of life and that is a hypersensitiveness to external impressions. While it subjects the possessor to a multitude of derangements of function, yet it warns him of the approach of evil and saves him from continuing in the path of danger. The want of this accounts undoubtedly for what would otherwise be called an hereditary tendency to accident. There is, of course, no heredity of accident; but there is a heredity of maladroitness, a lack of instinctive alertness.

Now the question is whether the second factor of longevity—obedience to natural laws—will prolong human life. If the human machine is properly constructed it should, like all ingenious mechanisms, run till worn out or until the reparative processes have ceased. Most lives begin by violation of law, in the midst of impure air, with restricted development of muscle, improper food, exposure to extremes of temperature and later the hothouse process in work or education, hyperstimulation of the intellectual faculties and unhealthy competition for wealth or position. The child learns the effects of fire by being burned, the youth the effects of folly by headaches or other forms of suffering. We only learn to live according to the laws of nature by the results of transgressing them. As to the waste and repair of the tissues, the tendency to retrograde metamorphosis increases with years. The vital processes of regeneration diminish with still greater rapidity.

Professor Bizzozero, of Turin, divides the tissues of the body into three groups: (1) Those histological structures whose elements multiply throughout life—show continuous

regeneration, as the spleen, the glands and the marrow of the bones. (2) Those which multiply up to and a little after birth with no subsequent regeneration, as the liver and the kidneys. (3) Those whose cells do not increase numerically after the embryonic stage, as the nerve cells and muscle fibres. If this is only true in part, it would still appear that any interference with the functions of the liver, the kidneys or nervous structure would meet with a less and less tendency to restoration to the normal and would early result in organic change, while careful living and abstemiousness would preserve their integrity even with failure of the inheritance of persistent vitality. If a man could attain to the condition of the Buddhist ascetic—abstemious, protected from the changes of climate and free from all care and anxiety, he would be immune as regards all diseases save those transmitted from his fellows and would approximate the limit of man's natural life. In proportion as he approximates this simplicity and asceticism he prolongs his existence. Man wears out in the rush of activity resulting from cerebral stimulation of whatever kind. Like a candle, if allowed to burn slowly he burns long and well; but, fanned by currents of air, swails and sputters and is rapidly consumed. There are so many abnormalities of moral as well as of physical characteristics that the individual is moulded and bent often to his own destruction. They interfere with his interpretation of nature's laws. As a rule, after passing middle life, men begin to live more careful, abstemious lives, to avoid their former over-indulgences. With the dropping-off of friends and companions they abandon excesses in wine, tobacco, late hours and all that that implies. A few continue to use wine and tobacco liberally, to indulge in the excitements of speculation; but the great majority are over-sensitive to every thing that education or instinct pronounces deleterious. Probably not much sacrifice is involved in this change, as the gratification has lessened, because the acuteness of the pleasure has faded and the capacity for enjoyment correspondingly lessened.

A striking characteristic among those who possess a remarkable hereditary longevity is their tendency to complain

about their own health. One old woman, who at one hundred and three was as loth to tell her age as a woman at thirty, spent the intervals between eating and scolding in complaints of a hideous variety about her health. This she had done for many years. Another centenarian, who was in no sense decrepit and who had always lived like other men without practicing self-denial, always, as far back as he could remember, had had something the matter with him to make him miserable; but he said that his father before him also had suffered in the same way and so he thought he could stand it.

Dr. Holden said that some of the old men on his list had valvular disease of the heart in a quiescent, non-progressive state, but finally died from other disease. The few who had not inherited longevity had always been very careful and abstemious. Those who were proud of some aged ancestor had been less so; but most of them had become gradually more and more observant of nature's laws.

Some of the bodily characteristics of the long-lived were mentioned: a full chest, a body long as compared with the total height, large superficial veins as favoring return circulation, large strong bones, a placid-working brain, a dominant will—these are very frequent characteristics of the long-lived.

In closing Dr. Holden referred to a few aphorisms of Lord Bacon, in which moderation in all things was recommended in one form or another, and closed with a reference to Lord Bacon's canon (No. XIX.) for the benefit of modern believers in animal extracts, viz.: "Youthful spirits inserted into an old body might soon turn nature's course back again."

The paper was followed by general discussion.

SIXTH ANNUAL MEETING.

The Sixth Annual Meeting of the Association was held at the office of the Mutual Life Insurance Co., New York City, May 23d and 24th, 1895. The fol-

lowing members were present at some time during the sessions:

Drs. Barrows, Bernacki, Brannan, Burrage, Chapin (Home Life), Chatard, Curtis, Davis (J. L.), Devendorf, Fisher, Foster, Gage, Grant, Gray, Hamill, Holden, Homans, Huntington, Lambert, Marsh, Munn, Paddock, Rogers, Shepherd, Stebbins, Tabb, Thorburn, Vandewater, Van Wagenen, Webb, Wells (G. W.), White, Wilkins, Willard, Wood, Young.

The minutes of the last annual meeting and of the meetings of the Executive Committee were read and approved.

The Treasurer's report was read and accepted.

The President then opened the meeting with the following address on

THE OBJECT OF THE ASSOCIATION.

It seems appropriate, at the opening of our annual meeting, that one whom you have honored by election as your President should make some remarks relative to the object of our Association.

Our constitution aptly states one of the chief objects as the promotion of medical science, as applied to life insurance. We may perhaps define this as all in medical science, or its collateral sciences, that will enable us to better discharge the duties that devolve upon us in the selection of lives for insurance.

As we must know the significance of disease in its relation to continuance of life and the bearing of all environment conducive to its prolongation, it follows that from hygienic and sanitary legislation to the science of heredity and the study of reversionary degeneration, the widest range of medical acquirement is desirable. We should not, moreover, forget that our thousands of medical examiners have the right to look to us for correct rulings based on adequate scientific

attainment. As these gentlemen include men of the highest medical standing, it is essential that on the scientific questions of the day, from cell proliferation and the defensive proteids to the toxicology of ptomaines and advanced biology, we should keep abreast of the times.

We cannot afford, in the interests of our companies, to be at variance with the able examiners whose opinions we receive, without such decisions as can be supported by actual facts. Difference of opinion must arise, but such material should be accumulated by this Association as will sustain or modify or overwhelm the rulings by which many men are annually deprived of the advantages of life insurance.

DIFFERING IDEAS AS TO ELIGIBILITY.

It is surprising that so few physicians appreciate the wide difference that exists between estimating a man's physical soundness and his prospects for continuing sound through a given series of years. All of us, who have had large experience in private practice, know how insensibly the physician falls into the habit of regarding a patient who has recovered from a serious illness as restored to the condition in which the illness found him, as placed again in the great army of well men, with as good a chance of continued life as his fellows; to look upon a man of consumptive record, who has recovered from a threatened development of his family malady, as we would upon one rudely jostled on a bridge, but who regains his footing amid the hurrying throng; to regard the man limping from a hip-joint disease of childhood as well past his period of danger when the suppurating sinuses have cicatrized.

It is only when called upon as medical officers of Life Companies to stake large sums on the continuance of life for twenty, thirty, or forty years, that we realize that other factors than personal condition must enter into our calculations, and that to the collateral sciences of medicine, as well as to the table of mortality, we must look for information.

We must weigh, not the significance of existing disease alone, but of past ailments and injuries, the bearing of family tendencies, and deal with the man not alone as he is, but as

he is likely to be. Much has been written on the subject of eligibility to insurance, but unfortunately so much of it has been crude and ill-digested that it has actually thrown doubt on facts well established by more competent observers; little, indeed, has the hard, cold, mathematical basis on which the actuarial part of insurance is based.

The consensus of opinion, especially as to questions of heredity obtained from the life work and observation of eminent men, while in my judgment incontrovertible, has yet to have its foundation facts arranged in the light of modern science and made available. It should be our aim to add to such material, and contribute such new matter as to give to our decisions the weight of mathematical accuracy. The end and object of it all to be:

PROPER SELECTION.

Placed as we are to guard the doors of entrance to large companies, our duties may be from a medical standpoint defined in a single word: "Selection." It is curious that circumstances and public opinion have so revolutionized the old ideas on this subject; perhaps full as much as the study of statistics and the deductions of science.

In the old days of the London Equitable, the applicants came personally before the directors, and after a period of probation were accepted or declined. Brewers and the ruptured were not eligible. Now the ubiquitous solicitor spreads his silken net, and the directors trust to the examiners to sort the contents.

The circumstance of haste, fast living and the uncertainty of modern wealth, and the public opinion which is coming to regard insurance as an investment; to look upon the coffers of our great institutions as containing legitimate pelf, have introduced new elements into the question of eligibility, and to-day proper selection is by no means a simple matter.

PRACTICAL SELECTION.

This now involves three elements: 1st. Primary selection by the company's agents. 2d. Selection by the examiner,

who endeavors to ascertain the party's soundness and to elicit as a medical expert correct statements of personal and family history. 3d. Selection by the medical officers of the company.

The fact that the examiner rejects from two to three per cent. of the primary selection, and the medical director seven to eight per cent. of the remainder, speaks for itself. In my judgment the primary selection by the agent is of great importance. If he presses and presents all who listen to his persuasive eloquence, many obviously bad will slip in. If he is just and honorable, he will not present for examination any whom he knows to be unsafe, and will not bias directly or indirectly the opinion of the examiner. I am glad to say and believe, that the general tone and character of life insurance agents is far higher than in former times, as, indeed, is the general character of life insurance business.

PRESENT DIFFICULTIES.

Permit me to attempt to simplify this question of selection. According to accepted tables, the insurance of all adult lives indiscriminately would yield a favorable mortality; but, as all cannot pay the premium, and many will not be persuaded of the beneficence of the institution, a selection inevitably results.

If we did not seek the well, the ill would seek us, and these are rarely blind to the benefits of our posthumous philanthropy. Now, if the average of the multitude would result favorably, the selection of those simply well would apparently prove profitable. We may grade the standing of those selected thus: There is the man simply well, he may be said to be one point above the line, for he is better than the man who is next him, who is ill. Then the man now well, with no previous impairment, has two points. The man now well, always well, and of favorable occupation, may be said to have an additional point. The man now well, always well, of favorable occupation, and of long-lived stock, has still another point—and so on. As we pile up the favorable points we might obtain a selection that ought to give an

enormous advantage over the estimated general rate of mortality.

Alas! however, this beautiful plan of selection is counter-balanced. Men do not as a rule seek insurance: it seeks them. The vigorous man, who laughs at possible death, becomes hardened against the solicitor's importunities, yet he yields after some forewarnings of his mortality are thrust upon him. The man who has had many warnings requires only a sufficient surplus to pay the premium, or credit on which to borrow, and yields at once. The sick man listens promptly to the solicitor who happens to be unscrupulous enough to ask him, and often signs any statement whatever, on the plea that the company speaks through its agent and must take care of its own interests. An examiner, also unscrupulous, is readily found. A counterfeit of the applicant, and not the applicant as he is, is presented to the company.

The simple plan we have stated, however, encounters a worse obstacle in the general weakness of human nature, from which neither agent nor examiner is exempt, and this is the bias of judgment where self-interest is involved. The agent who is to receive seventy or eighty or five hundred dollars in case of acceptance, or the doctor who has at stake the good-will and patronage of a friend, or who fears to offend or disappoint the agent who favors him, can hardly give full weight to a scrofulous joint, a fistula, a necrosed bone, or even a damaged lung; and, as a consequence of distorted vision, a man is presented as five points above the line who is infinitely below it. A theoretical standard of selection, therefore, is one thing, a practical one quite another.

The increased general knowledge of and demand for life insurance, and above all the fierceness of competition, have spread a leprosy of deception that demands increased safeguards and an untiring watchfulness.

Selection has come at times to be the pitting of craft, medical knowledge, experience, foresight and business activity against avarice backed by alertness and ingenuity. Fortunately, however, this is still exceptional, for, as I have said, there has been a steady advance in the tone and standing

of the general life insurance man, particularly of the more responsible subordinates who come under the influence of their principals, and these are now really men of integrity, who make the interests of their companies paramount to their own.

It happens, then, that our duties as medical directors have come to assume a complex form, in which medical knowledge and experience must combine with knowledge of men and affairs. Let me illustrate by two incidents of veritable experience. The first may be labelled: "The story of a scale of vaginal epithelium." The urine of an applicant for a large insurance contained a scale of vaginal epithelium. He was an unmarried man and had been in a lumber camp with men for three months. A slim foundation on which to build doubt of eligibility, and it seemed presumptuous to delay issue; but he was a stranger to agent and examiner, and the application was temporarily held up. Inquiry led to the fact that he had arrived in town the night before and had drunk heavily. Further inquiry showed that he had come from camp in a boat with another man's wife and that the beneficiary named in the application as his sister was this woman. While the man was waiting for his policy and stimulating the agent to hasten it, ostensibly that he might return to his camp, the husband appeared with two revolvers and a bloodhound. It is unnecessary, perhaps, to add that the agent retained undisturbed the first premium, and the company retained the policy. The applicant never called again for either.

The second may be styled: "The sequel of a trifling wound." An application casually mentioned a trifling flesh-wound last year by an Indian; full recovery. This was in January. The man's pulse was rather fast, but explained by the fact that he had ridden many miles. Haste was urged, as he wished to return. These statements did not appear as I have stated them, in one group, and consequently the application seemed without flaw. The agent had known the man by sight and representation; but, nevertheless, we thought it well to know the date of the wound and how it was

incurred. To condense the story: We learned by investigation that *last year* meant December, a few weeks before. The trifling wound, a knife-thrust given in exchange for a blow, and the Indian, after one or two rifle-shots at long range, had settled down to dogging the individual for his scalp. His haste to get his policy was natural, but he did not wait for it, and our apparently supererogatory correspondence deprived the man's widow of a handsome competence.

I have spoken of the changes that have come over the methods of selection, but greater changes have come over our special duties as medical directors. Selection would be an easy matter, if we could only feel that fidelity, carefulness and accuracy always characterized both solicitor and examiner. Gradually and insensibly it has come to be, at the home office, the weighing of probabilities, not alone of the applicant's prospects, but of the truthfulness of the record, a comparison of statements to determine collusion or concealments, a weighing of testimony from both interested and disinterested sources, and a grouping of all the facts of an application from its inception to its final delivery to our hands.

The conclusion of the whole matter is this, that as companies have gradually been brought into profitable co-operation through our influence as to the listing of rejected applications, and of unfaithful examiners, we may still further promote their interests by endeavoring to secure uniformity of rulings and the establishment of sound bases for the acceptance of risks. I would urge upon every member the duty of contributing information and of collecting and presenting the results of his experience. I feel sure that many lives are now deprived of the benefits of insurance that are probably entitled to it, and very many accepted that it would be to our interests to decline. Facts, hard, cold facts, that will bear the criticism of our actuaries, should be accumulated by this Association, and become alone the bases of our opinions.

The New England Mutual Life Insurance Co. having previously been admitted to the Exchange

by action of the Executive Committee, Dr. John Homans was elected to membership in the Association.

The resignation of Dr. S. H. Carney was accepted with regret.

The following resolutions on the death of Dr. John M. Keating were adopted:

JOHN M. KEATING, M.D.

Upon the 17th of November, 1893, John M. Keating, M.D., Medical Director of the Penn Mutual Life Insurance Company of Philadelphia, and first President of the Association of Life Insurance Medical Directors, died after an illness of three years.

Having been attacked by the grip, with his usual energy and his conscientious regard for duty which was ever present with him, he resumed his labors before he had entirely recovered his vitality. Serious pulmonary disease ensued which caused him to seek a residence in Colorado, in which State his indomitable will found occupation in the active practice of his profession.

Returning to Philadelphia in 1893 for his annual visit, his physician pronounced the lesion of his lungs as practically cured. Buoyed up by the prospect of an early return to his native city, in which he had acquired an enviable reputation as a physician, a brilliant author and as an upright citizen, he started on his return to Colorado in the late fall. Receiving during the journey news of the sudden death of a relative, a profuse hæmorrhage from the lungs occurred from which he never rallied. His death took place a short time afterward and came as a crushing blow to his many friends and acquaintances.

Upon reviewing the life of Dr. Keating, certain of his characteristics appear to stand out in brilliant prominence, namely, the lofty standards which invariably guided his actions and the unconquerable energy which, linked with his fine mind, made an assured success of all his undertakings.

To these traits of character the Association owes its creation, since, with him, consciousness of duty meant immediate action. Elected the first President of the Association, he brought to its management his great executive abilities, in order that it might be placed immediately upon a firm foundation. Its growth and its advantages, which have been clearly demonstrated, are lasting monuments to his forethought and to the deep interest which he invariably manifested in all life insurance work.

His death has taken from the profession a skilled practitioner and a brilliant author; from this Association a valued member and from his intimates a trusted and beloved friend.

To commemorate Dr. Keating's devotion to the interests of life insurance and to emphasize our lasting appreciation of his services to this Association, it is hereby

Resolved, That this report be spread upon the records of the Association and that separate space be allotted to it. As expressions of esteem for a pure, honorable and successful life must always be of priceless value to the bereaved widow and children, it is still further

Resolved, That a copy of these minutes be transmitted by the Secretary to the family of our deceased friend.

The following officers were elected for the ensuing year:

PRESIDENT.

DR. EDGAR HOLDEN.

1ST VICE-PRESIDENT.

DR. H. CABELL TABB.

2D VICE-PRESIDENT.

DR. F. W. CHAPIN.

SECRETARY.

DR. O. H. ROGERS.

TREASURER.

DR. J. W. BRANNAN.

EXECUTIVE COMMITTEE.

DR. EDWARD CURTIS.

DR. E. J. MARSH.

DR. A. HUNTINGTON.

DR. FRANK WELLS.

SECOND DAY.

The question of the importance of establishing a uniform standard table of heights and weights and dimensions of the chest and abdomen having been very generally discussed, a committee was appointed to revise the tables at present in use with power to call upon members of the Association for assistance.

It was ordered that the name of Dr. H. Cabell Tabb be inserted in the minutes of the preliminary meeting of the Association as having offered the resolution that a permanent organization of the Association was desirable.

The following resolutions on the death of Dr. H. F. Lyster were adopted:

Resolved, That this Association has received with sorrow the announcement of the death of Dr. Henry F. Lyster, late Medical Director of the Michigan Mutual Life Insurance Co., of Detroit, Mich., and an honored member of this Association, and desire at this time to place upon record this tribute to the memory of one who by his genial disposition, kindness of heart and refined feeling has endeared himself to every member of this Association. With a record of work well done he has entered into rest, leaving behind him a life history upon which there rests no shadow and a memory which is dear to all who knew him.

Resolved, That a copy of these resolutions be placed upon our minutes and copies be sent to his bereaved family and to the Company which he so long and so faithfully served.

It was decided that the next meeting of the Association be held at Richmond, Va., at a time to be fixed by the Executive Committee.

Dr. Curtis then read a paper on

THE MEDICAL EXAMINER—HIS SELECTION,
APPOINTMENT, INSTRUCTION AND
EMPLOYMENT.

It has seemed to me that it would be very serviceable for the Association if the several members would compare notes as to the customs of their respective companies in the matter of the appointment and employment of local examiners. My paper will accordingly simply be a presentment of the practice in this regard of the company I serve.

This practice is based on the following principles:

I. In the *selection* of examiners, regard must be had to a special combination of attributes. For the sake of the *company's* interests, the ideal examiner must be professionally competent and of fair experience; honest, sober, and of good morals; firm, but not obstinate; self-reliant, but not conceited or crotchety. For the sake of the *agent's* interests, he must also be able-bodied, courteous and obliging, conveniently located and not so busy but what he can answer calls for examinations without undue delay. For the interests of the *business generally*, he must, furthermore, be prompt and accurate in business dealings, and it is a secondary advantage if he is able and willing to say a telling word, on appropriate occasions, in favor of the company he serves. This last consideration, however, is only to be taken into account as between possible candidates when all other things are equal.

II. The *appointment* of examiners should so be ordered that the appointee will be conscious of filling a dignified and responsible office, from which he will not be removed without substantial reason, and will understand that he serves the medical and not the agency department of the company.

III. The *instruction* of examiners should rather be practical instruction in the art of conducting and reporting a medical examination than a dissertation of risks as risks, which is a question that more concerns the medical director than the medical examiner.

IV. The *employment* of examiners should so be ordered

that, for a given case, neither the agent nor the subject can himself have a choice of examiners.

In accordance with these principles, the practice of the Medical Department of the Equitable Society in the four points under consideration is as follows:

I. THE SELECTION AND APPOINTMENT OF EXAMINERS.

In view of the various considerations that, as already seen, have to be taken into account for the make-up of a good examiner, it is clear that, where a choice among candidates presents, questions of *personality* are of prime importance. Hence, in such case, he who is to do the selecting should be one who, understanding fully the requirements, either himself already knows concerning the personalities of the possible candidates, or knows where and how to obtain such necessary information. To fulfil these ends, the entire country is mapped out into districts as small as may be feasible, to each of which is appointed a *medical nominator*, so-called, who is ordinarily the chief medical examiner for the most important place in the district. In well-populated States, such as New York, each county constitutes by itself a nominator district, but the nominator is preferably a prominent officer, past or present, of the County medical Society. Since the functions of a medical nominator include, often, *investigation*, and nearly always a *selection*, involving a judgment between rival candidacies—all of which functions call for time, trouble, responsibility and possibly expense, the nominator service is one of pay, the nominator receiving a small fee for each nomination officially required and satisfactorily made. Such medical nominator stands in the relation of advisory counsel to the medical directors in the matter of a selection of *chief* examiners for the various places in his district. To him resort is made if, as of course is the case more often than not, the medical directors do not themselves have the data for a wise selection of a chief examiner, and to him also the *agent* is permitted to apply directly for the name of some one to use when he strikes a place where no examiner has yet been appointed. When so nominating directly to an agent, the

nominator also reports the nomination to the Home Medical Department.

The nominator is supplied with blanks on which appear full instructions on the one side, and, on the other, a form for the making of a nomination. The instructions define the considerations entering into qualification for examinership, as already outlined, and allow of the selection, when necessary, of a non-graduate, if unquestionably competent and a legal practitioner in his community, and of a physician of sectarian affiliation again if properly qualified. The nominator is directed to avoid the very old and the very young, and is specifically enjoined to refuse to nominate at all for a place where there may be no physician up to standard. In such case the agent is required either to use some neighboring regular examiner or to abandon the place for business. The reverse of the blank provides a form for the making of the nomination, which form calls for statement, concerning the nominee, of approximate age; college of medical graduation (if known to the nominator); approximate duration of practice in present locality; rating of attainments, character, and habits; post-office address; statement of reasons for particular selection and citation of sources of information.

Such is the procedure for the nomination of a *chief* examiner. In the case of an *alternate* examiner, who, under the rules, is employable only as a substitute for the chief or as his associate in double examinations, application for the selection is made *not* to the nominator for the district but to the *chief examiner for the place*. This course is so as to make certain that the two examiners in any given place shall be practitioners of cordial relations to each other—a condition for obvious reasons to be desired. But since in this case the selection is, in a certain sense, a privilege to the chief examiner, the nomination by a chief of a candidate for the alternateship of his own town is not regarded as a pay service.

When a nomination is received at the home office, the name is communicated at once to the manager of the agency concerned, with authorization to employ the nominee and with request to notify the medical directors of any possible

objection from the agents' point of view to the proposed appointment. Any objections so made are given due consideration; but if, after waiting a reasonable time, none are received, a blank form of credential is sent to the nominee, asking for the usual statistics concerning the nominee's medical history and calling for the naming of three physicians, personally acquainted, as references. When the credential is returned the references are written to, inviting their testimonials, and also inquiry is made through a mercantile agency, in order to get a lay opinion as to the nominee's general estimation in his community. When such testimony as is received proves satisfactory, a commission of appointment is issued, valid "during the pleasure of the Society's Medical Directors for the time being." The commission for a *chief* examiner entitles the holder to "the privilege of such of the medical examinations" for his place and its immediate vicinity "as he may be able, on application, to make without undue delay." The commission for an *alternate* examiner simply establishes the holder as an approved examiner employable for such examinations in his place or vicinity "as may properly be required at his hands by any representative of the Society." Examiners are subject to retirement, at the pleasure of the medical directors, on attainment of the age of sixty-five years, and a commission is vacated by removal of residence to another town.

II. THE INSTRUCTION OF EXAMINERS.

With the commission of appointment there is sent to the appointee a little hand-book for the examiner, prepared in the Society's Medical Department, which, together with the medical-examination-report blank, constitutes the examiner's instruction. The hand-book deals first with the topic of the *medical examiner*, as to matters of selection and appointment, commission, qualification and method of compensation; secondly, with that of the *medical examination*, in the matter of practical hints of all kinds, but without attempt at instruction in physical diagnosis, except in a few

points in urinary analysis; thirdly, with the *rating of the risk*, giving explanation of the general principles involved and a recital of the Society's own practice in the more commonly-occurring conditions affecting assurability; and, fourthly, with the subject of the *examination-report*, giving practical points and reciting circumstances where special supplementary reports should be rendered in addition to the general one required by the examination-report blank. The book gives also standard tables of mortality and of the expectation of life.

The hand-book is supplementary to the examination-report blank itself, for upon the report blank are spread as many items of instruction as can conveniently be expressed in condensed form.

III. THE EMPLOYMENT OF EXAMINERS.

Rules for the employment of examiners are, in the service of the Equitable, very strict. At a given place the agent must use the chief examiner, whenever available, and, when using any other, whether alternate or stranger, must fill up a blank form to be attached to the examination-report, stating the circumstances that made the chief examiner unavailable for the case. When the papers are reviewed in the Medical Directors' office, if there be any reason to doubt the honesty of the statement rendered, the agent's certificate is sent to the chief examiner for his verification, and, in any case where a *stranger* physician is used at a place where there is an appointed examiner, the chief is invariably communicated with. He is in such case given the name of the subject, name of the physician employed to make the examination and the reasons alleged for the necessity of using a stranger, and he is asked for his opinion as to the competence and reliability of the examiner and as to the probable assurability of the risk. If the reply to these queries develops even a suspicion of crookedness in the case, a re-examination of the subject by the regular examiner is required.

If a subject living at a place where there is an appointed

examiner be examined elsewhere, or if a neighboring examiner be brought to examine at a place itself provided with an examiner, the circumstances must be explained satisfactorily.

If a subject has once been reported adversely by a certain examiner who was proper for the occasion, and the case is to be re-considered later upon the basis of a new examination, such new examination must be made by the original examiner, if possible, provided, of course, such examiner is still in the Society's service and in good standing.

DISCUSSION OF THE PAPER.

The paper was then discussed as follows:

Dr. Barrows said that the Phoenix made use of practically the same system of referees.

Dr. Chapin said that the method in vogue in the Home Life was such as had been described, except that they had no special inspection at the home office. He wished they had.

Dr. Davis described the custom of the Union Central, where the examiners were rated 1, 2 or 3, as to their ability in diagnosis, and A or B, as to their character, habits and standing. The first examiner was required to endorse the examinations made by the second. The examiner was selected through the nomination of the agent going into the new territory, and the manager or general agent was held responsible for the examiners in his territory.

Dr. Fisher said that the Northwestern made its appointments directly from the home office. It had no system of referees. It required not only medical endorsements, but also the endorsements of prominent citizens. The effort was to have as few physicians as possible in each territory, so as to give each examiner a sufficient amount of work to make it an object for him to put himself out in the interests of the company. It does not object to the employment of examiners who examine for other companies. It makes use of a commercial agency.

Dr. Foster said that the Union Mutual appointed all its examiners directly from the home office; but, where a large number of examiners were required in a district not already covered, the leading physician already appointed an examiner for the district acted as a referee. The company is in favor of appointing men who are examiners for other companies.

Dr. Grant agreed with Dr. Fisher, that the more companies a physician examines for, the better service he is likely to give.

Dr. Hamill trusted entirely to medical counsels established at various points throughout the country. References were also required from the physician recommended by the counsel, and such references, as well as the report of a commercial agency, had to prove satisfactory before the appointment was finally made. He believed in the system of paying salaries where the business warranted it. He preferred to appoint physicians who examine for other companies.

Dr. Homans said that the New England Mutual made use of a chief medical examiner in each district to secure the names of proper examiners in that district. He required five references: three physicians and two laymen. He also made use of a mercantile agency.

Dr. Rogers said that the New York Life made its selection of examiners from the home office. It believed that its results were better on the whole than they had been when the company employed State referees. At one time the company accepted nominations from the agents, but now the selection of examiners was made in advance of the work of the agent. The custom was to secure recommendations from neighboring medical examiners, the physician chosen being the one favorably mentioned by the majority of those consulted. The physician thus named was at once investigated in the usual way. Salaried medical examiners, in the few places up to this time experimented upon, had been found to be entirely satisfactory. The policy of the company was to appoint young physicians. It made no effort to secure the services of distinguished physicians in the larger

cities, as it was felt that these men were too busy with other work to give medical examinations the proper attention, and, while their judgment of risks was undoubtedly the best, it was impossible to be sure that you had their deliberate judgment. The work of the older men did not compare at all with the work of the younger men.

Dr. Marsh said that the custom of the Mutual is very like that described by Dr. Curtis. While the system of county nominators seemed an excellent one, yet it involved a great amount of correspondence from the home office, and therefore a larger division of territory seemed desirable. He had only forty or fifty men with whom he corresponded on the subject. He tried to keep places supplied in advance with medical examiners. The referees sent their nominations forward, with the references endorsed with their approval or disapproval. Mercantile reports were used to verify the findings of the referee. He was not very particular as to which examiner was employed; but, if the junior examiner was employed too frequently, the agents were requested to desist. He had found the appointing of examiners in harmony with each other not always satisfactory.

Dr. Holden used both State and county referees. The system of county referees had worked admirably. He always made use of a mercantile agency. He never required references, nor did he write for them.

Dr. Munn said that the United States Life secured its nominations from several neighboring examiners. It never allows an agent to have any voice in selecting examiners. The examiner understands that he may retain his position as long as his work is satisfactory. It prefers young physicians for examiners. It makes use of a system of inspection made up principally of physicians who travel through the country to inspect risks, examiners and agents.

Dr. Paddock said that the Berkshire Life made an effort to appoint examiners in advance of the work of the agent. The credentials are secured of several physicians in each community and the choice made after the papers are complete.

Dr. Shepherd said that the Connecticut Mutual had a medi-

cal referee at the home office, who is in correspondence with physicians in almost every county throughout the States in which the company does business. He visits the various parts of the country from time to time and secures his information in person. He rarely made use of the commercial agency, as he had found it unsatisfactory. He favored older rather than younger men, and felt that the chief examiner should be a man of mature judgment.

Dr. Tabb said that in the Life Insurance Co. of Virginia the appointment of examiners was kept entirely out of the hands of the agents. He made use of the usual reference system, but did not employ nominators or referees.

Dr. Thorburn appointed a referee for each province and issued a certificate of appointment to the physician.

Dr. Willard said that the method of the Metropolitan combined features of all the methods mentioned. In opening up a new territory, however, a representative from the home office made the selections.

Dr. Devendorf suggested that an interchange of information about examiners between the companies would save much work and money, as the companies were all duplicating their work.

Dr. Curtis, in closing the discussion and in answer to Dr. Marsh, said that he chose his county referees by means of references.

Dr. Stebbins then read a paper on

PRACTICAL SUGGESTIONS CONCERNING LIFE INSURANCE.

In casting about for a subject for my paper which had not already been completely exhausted by abler writers, I was led to repeat the inquiry of the poet Holmes, viz.: "Why cannot somebody give us a list of things which everybody thinks and nobody says, and another list of things that everybody says and nobody thinks?"

So much has been said and written upon all matters pertaining to life insurance, that to be at all original is a difficult

matter, unless the bill may be filled by a distinguished writer's definition of originality, which, he says, "consists quite as much in the power of using to purpose what is found ready to hand as in that of producing what is absolutely new," and therein I may take refuge. By selecting the subject of "Practical Suggestions concerning Life Insurance" I shall be able to so scatter my shot as to admit of the possibility of hitting upon some idea which may possibly bear the impress of freshness.

The question once asked by a distinguished scientist was, "What is the groundwork of all science?" and, receiving no reply, his own answer was summed up in a single word, viz.: "Uniformity." While life insurance is not one of the exact or natural sciences, it is nevertheless a good deal of a science when considered in all its details, for must not the actuary be familiar with *mathematics*; those in charge of the princely revenues be conversant with *finance*; the medical examiners be able to comprehend the relation between *cause* and *effect*, as applied to physical conditions affecting candidates for insurance; those who sit in the judgment halls of the great companies be good detectives, that they may be able to sift the *sound* from the *unsound*, the *honest man* from the would-be *swindler*, the *genuine* from the *counterfeit*:

We will now let this prelude prepare the way for the application of *uniformity* to life insurance affairs.

The *first practical suggestion* I had in mind when I announced my subject was the adoption of a uniform medical-examiner's blank, but I found that I was confronted at the very outset with opposition by the literature of recent date touching the matter, in which it was declared to be quite, if not altogether, impossible.

On the contrary, why is it not as possible as it was for a committee to so prepare and revise scriptural versions which had been sworn by for generations, that they should better accord with the advanced thought of the age and better meet the requirements of the whole human race, not only for the life that now is, but for the safest insurance for the life which succeeds this?

Why not, as well as the formulation of a Nicene Creed, which unites in harmonious belief the larger part of Christendom?

Why not, as well as the papal encyclical, or bull, which establishes perfect concert of action of the whole Catholic world?

Why not, as well as an alliance of nations, which says to the rest, "Fall into line or keep off the field"?

Why not, as well as that a syndicate shall dictate to the entire country the price which consumers must pay for oil, flour, corn or cotton? Impossible! I not only believe it to be possible, but practicable and desirable.

I feel confident that the members of this Association, or a committee chosen therefrom, could so frame a blank as to include all the questions necessary to cover the whole range of diseases, physical conditions, family history, habits, age and everything needful for an examiner to know. I see no reason why any important question need be omitted, to be supplied by one company or another, as has been suggested. I fail to see why a blank which fully meets the requirements of one representative company should not equally well answer the purposes of another and of all.

I have known of repeated instances where an applicant has looked over a given blank, and finding a disease mentioned of which he was a victim, has consulted others until he found one with that special infirmity omitted, evidently thinking that if the question was not in the list, and was not asked, he was under no moral or other obligation to make the truth known. I thoroughly believe that an exhaustive uniform blank would contribute to honest declarations on the part of the applicants, and I believe it would lessen to a great degree their trying two or three companies at a time, to see which they could squeeze through.

My *second suggestion* concerns the disposition of the medical-examiner's blank, after an examination is made. The custom of some companies of having the examiner's blank separate from the agent's, and having it mailed separately to the home office, is worthy of universal adoption.

It would save medical examiners no little annoyance, for how often it happens that an agent, looking over the examiner's report, finds something which is likely to endanger acceptance of the risk, and argues the points at issue, takes various exceptions, and, if an adverse report is given by the examiner, goes the rounds of the various companies before mailing the application, until he finds a safe harbor for his victim.

Whenever an applicant is examined for one company that report should be submitted to and acted upon by that company, before he should be allowed to be presented to another, so as to avoid any collusion or underhand methods, and the general adoption of the foregoing rules would, I believe, tend to this result.

My *third suggestion* is that there should be uniform rules or causes for rejection of applicants. Certainly, what is a good and valid cause for rejection in one company should be in all. If, for example, an applicant is declined in one company for albuminuria, valvular disease of the heart, a phthisical history, by what process of transformation can he be made a desirable risk for any other company?

It was the Evangelist Moody who said of heaven, that "it was a prepared place for prepared people," and I always supposed that first-class life insurance companies were prepared places for reasonably *sound* and *healthy* people; but my observations of the last few years have led me to believe that there is more than one company which is an exception to this standard, and that they appear to be *prepared places* for *impaired people*.

When an agent works hard and honestly and succeeds, after long and tedious effort, in writing up a business man for a large policy, only to have him rejected, he naturally feels his loss; but when an agent for another company near by presents the declined risk to his company, and it is accepted, it makes the first agent feel as though he were working against wind and tide. As an illustration of this, I remember, two or three years ago, declining to recommend two risks: one, for the reason that the applicant was very light weight, ex-

tremely nervous, easily agitated, and, from his manner and answers, I was somewhat in doubt whether the man was addicted to drink or whether he was on the verge of insanity. After the examination was over, I inquired privately of the merchant, in whose employ he was, about him, and he informed me that he was temperate, but he could not tell half the time whether the applicant was sane or insane.

The other risk I declined for the reason that he had a strumous history, necrosis of both bones of one leg, four inches above the ankle, with ankylosis of the joint, etc. Both risks were passed by an examiner of good professional reputation, and accepted by one of New York's largest companies. Wishing to know on what ground the examiner advised these risks, I asked him, and his answer was that he believed that such people, by virtue of their impaired health, would take much better care of themselves, and hence their prospects for longevity were quite as good in his opinion as those of vigorous health who would risk more.

Such conflicting rules and methods work against the best interests of all concerned, and, therefore, I believe there should be, so far as possible, uniform rules for rejection.

My *fourth suggestion* is that agents should not be permitted to control the selection and appointment of medical examiners for obvious reasons. Their work being based and carried on upon the commission plan, the relation of the medical examiner to them becomes one of vital importance, for upon his verdict depend the rise and fall of their revenues, hence, there is a *temptation*, perhaps we should not say *inclination*, to suggest as desirable examiners those, in the first place, whom they think they could insure, by holding out inducements in the line of medical examinations; and, in the second place, those whose opinions they might be able to mould, the better to meet the demands of their own. Agents are human, and it is human nature to take advantage of circumstances, and do just those things of which I speak.

Medical examiners are just as *human* as *agents*, and when the question comes between cordial obedience to the agent's requirements, or no business, the *temptation*, not to say

inclination, is to ignore the best interests of the companies in whose service they are. Agents might be—I don't say they are—tempted to select examiners too open to conviction, too amenable to argument, and who says that agents are not adepts in that business? Take a vacillating examiner, and they would almost convince him of the non-existence of such a disease as phthisis, except of the acquired type, and convince him also that that need not cut much of a figure in the calculations of the applicant's longevity; that spitting of blood, in the vast majority of cases, was a mere accident, occurring from some abrasion in the naso-pharynx; almost never below, a temporary flurry of the circulation, of no serious import.

Agents also often multiply the number of examiners in a given place, much beyond the requirements of the company's business, in order that they may utilize one and another as best suits the case in hand.

Where there are several examiners for an agent of a given company, the poorest are often selected to act upon doubtful cases, or largely used in preference to the better qualified. By way of illustration, I will cite an instance or two out of many which have come under my personal observation.

A large representative company had an agency in a city of 45,000 population, the agent having fully a half-dozen examiners on his list, about one-half good, the others below the average standard of professional qualifications. The one most generally employed reported a case where he examined the urine, and, having boiled the specimen, a white precipitate resulted, which did not disappear, nor was at all changed by addition of nitric acid, and therefore he reported there was no albumin present.

Inasmuch as the examiner has recently died of Bright's disease, I have yet to learn whether he found out the presence of the disease or someone else for him.

Another examiner, much employed, had a patient, a girl in her teens, with some disease which he diagnosed inflammation of the bladder, of which she died. He gave it as his

opinion that her trouble was doubtless caused by some enlargement or other affection of the prostate gland.

Another examiner had passed two applicants, but, before policies were issued, a second examiner was sent to look them over, and one applicant had been ill six months and was found in advanced phthisis, the other ill with acute bronchitis.

Now, I wish it to be distinctly understood, that I do not for one moment believe that the majority of agents would countenance this sort of work, for there are most excellent, honorable, business men among them; men of excellent character, sterling business integrity, men to be trusted at all times, and under all circumstances, and such men would not object to being removed from temptation.

A medical director of a New England Life company told me a year ago that, from a given agency, his company would receive a good list of applications every few days, every one presenting a spotless family record and a faultless personal history, until finally his suspicions became aroused, and, stating them to the President of the company, he was informed that it probably was a mere coincidence and doubtless was all right. The same reports continued, when finally the medical director said to the President that he might approve if he chose, but he could not, believing, as he did, that something was wrong.

A little private detective work was instituted, which revealed the fact that the examiner and the agent would start out together with a team, be gone all day, scooping in everybody they could find, and divide fees and commissions. Of course, in such a partnership, family records and rejections would be quite out of order and not to be expected.

An agent who will disgrace his calling in this way, and bring his company into disrepute, is bad enough, but a medical examiner who has neither character nor conscience is worse, and is himself the strongest possible argument for those to use who believe companies would be as well off without any medical examinations.

My *fifth suggestion* is that frequent changing of agents and examiners seriously affects the standing and reputation of any

company, for it gives the community the impression that the company so doing lacks soundness and stability, or that there is some crookedness somewhere, and too often its impressions are well grounded. Take a merchant, a professional man, a manufacturer, and let him change location or management often, how soon will it provoke adverse comment, and how natural the financial and business failure, the wreck of professional reputation, which so often results.

My *sixth suggestion* refers to compensation to medical examiners. I am led to comment upon this matter by reason of the report that two of the leading companies here in New York have resolved to lower the fees paid for examinations from five to three dollars. The latter figure is much too large for many examinations that are made about the country; the former figure is quite small enough for any examiner who, by education, experience and conscientious effort, is considered equal to the task and trust of selecting investments for the companies in human life.

To cheapen the services of the medical department appears to me to be a mistake. Companies, as well as individuals, cannot secure much more than they are willing to pay for. The law of equivalents will be quite likely to prevail here as elsewhere. This is not altogether a gratuitous age, unless it be to the wandering tramp, the railroad robber, or a Coxey's Army. First-class service calls for its equivalent in compensation, and anything below that standard is a poor investment at any price for any life company, when the possible financial results are taken into consideration.

My *seventh suggestion* concerns the relation of agents to medical examiners, and the treatment of both by the home office, which, I claim, should at all times be fair, honorable and impartial, so that, in the event of fault being found with either examiner or agent, they should not be summarily dealt with, without even a court-of-inquiry or a chance to defend their professional honor or business integrity.

If a "good name is rather to be chosen than great riches," it is just as true of a company, or corporation, as it is in the case of an individual, or ought to be.

Touching the relations of agents to medical examiners, and how this relation is sometimes treated by the home office, perhaps I may be pardoned if, for example, I take two or three cases which have come under my personal observation, especially as I desire to be able to vouch for the truth of what I have to say.

A few years ago an examiner was called to examine a well-known officer of one of the largest railroads in New England, a man I had personally known and seen daily for years, one whom I had never known as being ill, and as fine a specimen of physical manhood as one often sees. Among the list of questions he answered "No" to, was, had he ever had vertigo? and, besides giving a clean bill of health, the examiner advised the risk, not having been made acquainted with the fact that one hour previously he had been examined by another examiner for the same company, to whom he declared that he had had vertigo. The agent knew the fact, and through somebody's influence the applicant was induced to contradict his first answer. The policy was issued; the man died in a short time, a year or so afterwards; the agent, the guilty party, was retained, and the examiner was summarily discharged, without any opportunity even to state his side of the case.

The second illustration concerns the principal examiner of one of the first-class companies of the country, who gave an adverse report upon the application of a merchant whom the agent was anxious to insure. In order to do so, the agent failed to send in this report, and secured another examiner to render a favorable report that was accepted by the company, which was called upon to pay the death claim, which was presented within two years. As the agent continued to employ this examiner, who was a man of unsavory reputation, a recognized abortionist, illiterate, etc., the first examiner stated to the company that he had rather retire from its service than be associated with a medical man of that stamp, whereupon the company informed the examiner that the agent was such a successful one that they should be obliged to let him have his own way in the matter. So the examiner

who stood for honor and principle was sent adrift after years of faithful and painstaking service.

Now, if an agent or examiner is not honest on one occasion, can he be trusted on another?

Let us sift the last example a little farther and see. The agent in question was, at the time of the foregoing transaction, also agent for several fire insurance companies, as well as a member of the New England Fire Insurance Association, whose rules and regulations he had sworn over his own signature to abide by. Within three months this agent was fined ten dollars each on nine separate and distinct violations of his sworn agreement with the Association, and was suspended therefrom. He also placed upon a block a large amount of contract insurance, the companies represented thereon distinctly stating in their policies that they would not insure buildings containing inflammable and explosive substances, mentioning a list among which was gasoline. But, unfortunately, this article was stored there, a fact well known to the agent, and in a few weeks, in some unaccountable way, an explosion of a barrel occurred about noon of a hot summer's day, and the building and contents went up in smoke and flame.

A short time afterwards, I heard one of his brother fire insurance agents ask him how he got around the ugly fact, and his reply in my hearing was, that he was obliged to tell them he did not know it was there. "I had to lie about it," he said.

An examiner with whom I am well acquainted was informed by the agent of his New York company that, if he wished to be retained in that capacity any longer, he must divide his fees with him, stipulating that the percentage should be one-third. The examiner politely informed the agent that he thought too much of his reputation to become a party to any such transaction as that, and the brief interview closed the examiner's labors for that company. Very soon after, somehow and somewhere, the agent took flight between the evening twilight and the dawn of morning, leaving behind many to make a still hunt for any assets remaining.

Now, it appears to me that all medical examiners or agents, who have received their appointment as such, and have performed faithful service, should, whenever any accusations are brought against them, have an opportunity given them to defend their honor and their reputation.

The agent should have faith in the examiner, the examiner in the agent, and the companies in both, in order to secure the best results, and all parties concerned should *stick to the truth* and *act the honorable part*.

Dickens declared that there was nothing so strong and safe in any emergency as the simple truth. Josh Billings said, "If you can't trust a man for the full amount, let him skip, for this trying to get an average on honesty has always been a failure," and what is true of examiner or agent applies with equal force to the companies they represent.

In the play of *Othello* occurs this passage: "Take note! Take note, O World! to be *direct* and *honest* is not *safe*." This rule might have answered as the governing principle of a Shakespearian character, but what this age needs above all things else is a thorough, genuine, universal revival of common honesty. There should be no sleight of hand, no jugglery practiced by companies or agents; no gold bricks promised to the applicant, that his heirs will find after his death to be only galvanized specimens. There should be no ambiguity in the wording of a policy that could skin it of its face value when honestly due and all demands upon it had been honestly met by the insured.

In all business, but especially in life insurance, "righteousness should be drawn to the line and judgment to the plummet."

CLASSIFICATION OF RISKS.

The final and decisive answer which the examiner has to give is the important one—the pivotal one upon which hangs as a rule the acceptance or rejection of the risk, and which fixes the character and grade of the same. The different forms in which the final question is put vary much in

different applications, all having the same end in view, viz.: the determination of the class of risk in which the applicant belongs.

For example, one form is, "Would you, if you were in business, invest your own funds in the life of the applicant?" Another form reads as follows:

"Is the applicant a first-class or average risk?" Still another form is: "Is the applicant a first-class, good or only a fair risk?" I admit that the answers to these several forms must of necessity convey different meanings, or have different weight according to the examiner giving the answer; for what one examiner would grade as a first-class, another would grade quite differently.

Take the third form mentioned, viz.: "Is the risk first-class, good or only fair," and whenever the examiner says the risk is good, that risk is stamped as not first-class, and raises the question why, and the acceptance of the risk is jeopardized in the opinion of the agent; and when it is pronounced as only "*fair*," the fate of that application is to all intents and purposes sealed; for who knows of many risks being accepted bearing that brand of the local examiner?

If you could always depend upon honest, conscientious gradation of risks it would be all right, but the inference to be drawn is that the first class has too many to its credit.

As for the first form, "Would you, if in the business, risk your own money?" I have to say that that is a very vital question, and I fear that practically it would be found that examiners would rather risk the company's money than their own. It is not safe to say that every risk is either insurable or not so; either a safe or unsafe investment either for a definite or indefinite term, and can there not be some uniform answer to a uniform grade?

Dr. Hamill read the following paper on

STATISTICS OF CONSUMPTION.

The purport of this investigation has been to determine: first, what value should be placed upon family history as re-

Total number of lives under observation (1886-1893).....	230,043
" " deaths " " "	3,306
Rate per 1,000.....	14.37
Number of males exposed to risk.....	156,736
" " deaths.....	2,296
Rate per 1,000.....	14.64
Number of females exposed to risk.....	73,287
" " deaths.....	1,010
Rate per 1,000.....	13.78

CAUSES OF DEATH, 1886-1893.

	1886	1887	1888	1889	1890	1891	1892	1893	1886 to 1893
I. Zymotic.....	3	27	30	35	33	46	64	61	299
II. Parasitic.....	..	..	..	..	..	1	..	..	1
III. Dietetic.....	1	1	..	2	6	8	5	4	27
IV. Constitutional	10	50	90	108	134	140	191	234	957
V. Developmental	..	..	..	..	1	..	2	..	3
VI. Local.....	29	95	153	181	262	280	345	417	1762
VII. Violence.....	1	13	19	25	31	45	57	55	246
VIII. Ill-defined...	3	1	1	1	5	11
Total.....	44	186	292	354	468	521	665	776	3306

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	ALL DEATHS, 1886-1893.	PER CENT. OF TOTAL.	ALL DEATHS WITH CLOUDY FAMILY HISTORY. 1886-1893.	PER CENT. OF TOTAL.
Zymotic.....	299	9.0	9	7.08
Parasitic.....	1	..	..	..
Dietetic.....	27	0.8	1	..
Constitutional.....	956	28.9	38	33.4
Developmental.....	3	..	..	..
Local.....	1762	53.3	61	53.0
Violence.....	246	7.4	6	5.2
Ill-defined.....	11	0.3	..	..
Total.....	3306		115	

The only point to be observed is that the percentage of deaths from constitutional diseases in the cloudy-family-history cases is in excess of the percentage of deaths from constitutional disease in the general mortality.

The following table shows the rate of mortality from consumption, per 1,000 exposed:

MORTALITY FROM CONSUMPTION.

Total number of deaths from consumption.....	781
Per cent. of all deaths.....	23.62

Rate of mortality, male and female....	3.40	per 1000	exposed to risk.
" " male,.....	3.60	" "	" "
" " female,.....	2.96	" "	" "

Below is appended a statement of mortality from *all causes*, at all ages, for eight years, from 1886 to 1893 inclusive.

MORTALITY FROM ALL CAUSES, 1886-1893.

	1886	1887	1888	1889	1890	1891	1892	1893	1886 TO 1893
15 TO 19..	1	2	3	6	..	..	..	..	12
20 TO 24..	4	26	38	35	44	53	49	66	315
25 TO 29..	8	32	67	57	76	66	89	113	508
30 TO 34..	10	30	35	60	76	93	113	121	538
35 TO 39..	6	27	35	47	56	63	113	114	461
40 TO 44..	4	27	37	44	66	61	71	79	389
45 TO 49..	4	9	28	40	54	57	63	84	339
50 TO 54..	5	17	21	21	36	55	67	85	307
55 TO 59..	1	9	20	30	36	46	65	59	266
60 TO 64..	1	7	7	13	22	21	34	38	143
65 TO 69..	..	..	1	1	2	6	1	13	24
70 TO 74..	..	..	..	..	..	..	..	3	3
75 TO 79..	..	..	..	..	..	..	..	1	1
Total	44	186	292	354	468	521	665	776	3306

The following table shows the mortality from *consumption*, at all ages, for the same period:

MORTALITY FROM CONSUMPTION, 1886-1893.

	1886	1887	1888	1889	1890	1891	1892	1893	1886 TO 1893
15 TO 19..	..	..	..	..	..	..	..	..	..
20 TO 24..	2	1	1	3	..	..	..	..	7
25 TO 29..	4	11	17	12	13	20	20	20	115
30 TO 34..	2	6	19	20	27	20	32	42	170
35 TO 39..	1	10	13	22	25	31	33	50	186
40 TO 44..	1	7	14	11	12	12	27	27	111
45 TO 49..	..	4	4	14	11	13	15	19	81
50 TO 54..	..	1	8	8	8	7	11	11	54
55 TO 59..	..	1	2	4	4	6	8	9	34
60 TO 64..	..	1	..	2	3	2	6	3	17
65 TO 69..	..	..	..	..	1	1	1	4	5
70 TO 74..	..	..	..	..	1	..	..	..	1
Total...	10	42	78	96	105	112	153	185	781

The following table shows the ratio of mortality from consumption, per 1000 exposed to risk, at different ages, both male and female:

MORTALITY FROM CONSUMPTION.

(PER 1000 EXPOSED TO RISK.)

	MALE AND FEMALE.	MALE.	FEMALE.
15 TO 19.....	2.97	3.04	2.86
20 TO 24.....	3.10	2.90	3.44
25 TO 29.....	3.42	3.21	3.93
30 TO 34.....	4.16	4.07	4.38
35 TO 39.....	3.51	4.09	1.96
40 TO 44.....	3.43	4.29	1.66
45 TO 49.....	3.00	3.25	2.57
50 TO 54.....	2.65	3.28	1.72
55 TO 59.....	2.28	3.63	0.33
60 TO 64.....	2.51	3.37	1.53
65 TO 69.....	2.61	..	5.10
70 TO 74.....	..	..	..

It will be observed that the ratio of highest mortality occurs between the ages of 20 and 35, especially between the ages 30 and 35. It will also be observed that the climacteric period does not seem to play an important rôle—the ratio of mortality at this period being less than at any other period, with one exception.

As has been stated above, inquiry was made into the immediate family history by the medical examiner. Every death from consumption from the immediate family was recorded whenever the fact was ascertained.

The following table will show the degree of taint in the family record:

	TOTAL DEATHS.	TAINTED FAMILY RECORD.	MEMBER OF FAMILY AFFECTED,				UNCLE
			FATHER.	MOTHER.	BROTHERS.	SISTERS.	
1886.....	44	..	..	..	..	..	..
1887.....	186	8	5	2	..	1	..
1888.....	292	10	2	4	2	2	..
1889.....	354	19	5	1	8	5	..
1890.....	468	20	7	1	7	5	..
1891.....	521	14	5	4	3	2	..
1892.....	665	16	5	3	5	3	..
1893.....	776	28	8	7	6	6	1
1886 to 1893...	3306	115	37	22	31	24	1

The above experience is compared with the experience of two other companies, the Mutual Life and the Washington Life, and also with the individual experience of both Drs. Cotton and Williams. It should be borne in mind that the enquiry of the other two companies and of Drs. Cotton and Williams was directed, not alone to the immediate family, but to collateral branches of the family, extending in some instances to a cousinship:

	TOTAL TAINTED CASES.	FATHER.	MOTHER.	BROTHERS AND SISTERS.	ALL OTHERS.
Prudential.....	115	37	22	55	1
Mutual Life.....	194	45	56	71	22
Washington Life...	296	33	68	138	57
Dr. Cotton.....	367	112	102	126	27
Dr. Williams. ...	344	43	67	224	10

Causes of death in above table not specified.

Table showing deaths from all causes and deaths from consumption, with percentage of same:

	TOTAL DEATHS FROM ALL CAUSES.	DEATHS FROM CONSUMPTION.	PER CENT.
Prudential (Industrial Branch)...	3306	781	23.62
Washington Life.	2000	353	17.65

	TOTAL DEATHS FROM CONSUMPTION.	DEATHS WITH FAMILY TAIN.	PER CENT.
Prudential (Industrial Branch) ..	781	32	4.0
Washington Life.	353	80	22.7

	TOTAL CLEAR CASES (ALL CAUSES).	CONSUMPTION.	PER CENT.
Prudential (Industrial Branch) ..	3191	749	23.47
Washington Life.	1704	273	16.02

	TOTAL CASES WITH TAINTED FAMILY HISTORY.	CONSUMP- TION.	PER CENT.
Prudential (Industrial Branch) ..	115	32	27.82
Washington Life.	296	80	27.03

The following table shows the total deaths from consumption and the deaths with cloudy family record, and percentage of same to total consumptive deaths:

PERCENTAGE OF TAINTED CASES TO TOTAL DEATHS FROM CONSUMPTION.

	ALL DEATHS FROM CONSUMPTION.	TAINTED FAMILY RECORD.	PER CENT. OF TOTAL.
Prudential, 1886-1893, <i>a</i>	781	32	4.0
Mutual Life, <i>b</i>	1031	194	18.8
Washington Life, <i>c</i>	353	90	22.7
Dr. Williams, <i>d</i>	1000	344	34.4
Dr. Cotton, <i>e</i>	1000	367	36.7
Dr. Hutchinson. <i>f</i>	1000	325	32.5

- a*. Prudential Experience (Industrial Branch), 1886-1893.
- b*. Mortuary Experience, Vol. II., p. 75.
- c*. Washington Life Experience, 1889, p. 140.
- d*. Mutual Life Report, Vol. II., p. 75.
- e*. Mutual Life Report, Vol. II., p. 75.
- f*. London Lancet, 1894, p. 1422.

**PERCENTAGE OF TAINTED CASES (ALL CAUSES OF DEATH) TO
ALL CASES (ALL CAUSES OF DEATH).**

	TOTAL CASES.	HEREDITARY TAINT.	PER CENT.
Prudential, 1886-1893.....	3306	115	4.5
Mutual Life Insurance Co.....	2262	296	14.4
Washington Life Insurance Co...	2000	296	14.8

The marked disproportion in the percentage of deaths among the cloudy cases, as shown by the personal observation of Drs. Williams, Cotton, and Hutchinson, with that of the other companies, is at once observed. Probably the facts elicited by these three gentlemen more nearly represent the actual condition than those given by the other companies, especially as shown by the experience of the Prudential.

AVERAGE AGE AT DEATH.

	MALE AND FEMALE.	MALE.	FEMALE.
Deaths from consumption.....	32.8	34.63	32.24
Tainted family history.....	39.4	40.33	34.16

**RELATION OF HEIGHT¹ AND WEIGHT TO CONSUMPTION
AND CLOUDY FAMILY HISTORY.**

	ALL CASES.	CLEAR FAMILY HISTORY (EXCL. DEATHS FROM CONS.)	DEATHS FROM CONSUMPTION WITH CLEAR FAMILY RECORD.	CLOUDY FAM. HIST. ALL CAUSES OF DEATH.
No. observed.....	3181	2348	722	111
Weight above American Standard.....	1852	1484	310	58
Per cent. of Total.....	58.2	63.2	42.5	52.3
Weight below American Standard.....	1329	864	412	53
Per cent. of Total.....	41.8	36.8	57.5	47.7
Average weight:				
Males and females....	149.1	151.2	142.3	147.7
Males.....	154.3	156.3	148.4	153.1
Females.....	136.8	139.9	125.7	136.4

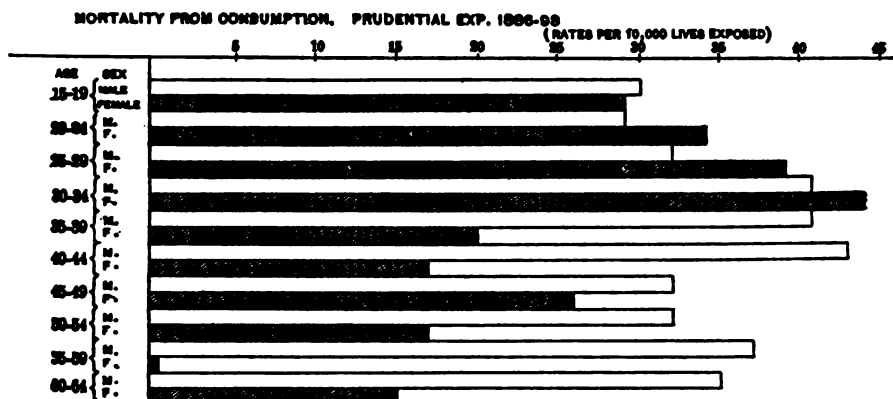
¹ Between 5 and 6 feet only.

DEATHS FROM ALL CAUSES.

PERCENTAGE OF CASES BELOW STANDARD WEIGHT.

	MALES AND FEMALES.	MALES.	FEMALES.
Clear Record and no Consumption.....	36.8	35.4	39.8
All causes.....	41.8	39.6	46.8
Cloudy records.....	47.7	49.3	44.0
Consumption.....	57.5	51.8	73.3

The following diagram illustrates the mortality of male and female risks, the shaded column indicating male lives and the unshaded female lives:



The following conclusions would seem to be warranted as the result of the investigation made:

First.—That the family history as given by the applicant is not to be relied upon as a general statement of fact. While it has its value in cases in which it is stated, the small percentage of returns would prove that at least two-thirds, if not more, are cases that escape observation. Thus only four per cent. of the total number of deaths in the Prudential experience show a tainted family record, against the nineteen per cent. of the Mutual Life and the twenty-three per cent. of the Washington Life.

In view of the large general mortality from consumption, it seems self-evident that the figures of Drs. Cotton, Williams, and Hutchinson represent more nearly the actual conditions to be met with in every-day experience; that is, of the total number of persons observed, at least one-third to one-fourth may be considered to have a direct or an indirect taint of consumption in their family histories.

It is the opinion of Dr. A. Rabagliati, Medical Adviser to the Friends' Provident Institution (England), that family history records are of far less importance than the actual personal condition of the applicant at the time of insurance. (See *Post Magazine*, April, 1895—an English Insurance publication.)

An elaborate article on this subject (Weight and Longevity), by T. B. Macauley, Actuary of the Sun Life, Canada, supports the experience of the Prudential in this respect.

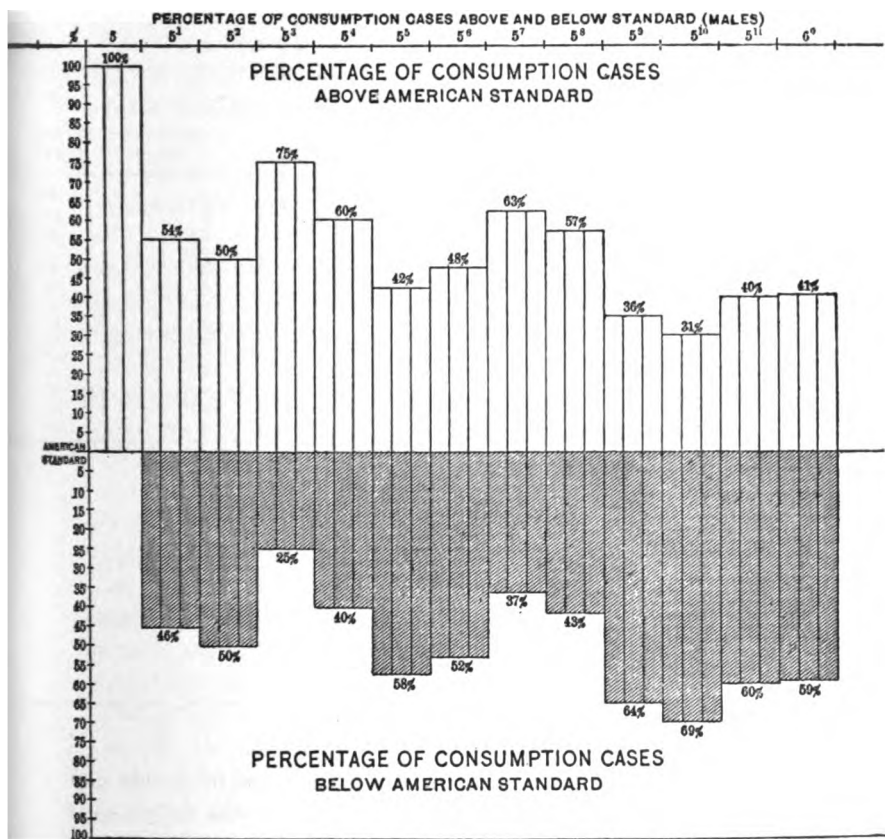
In the comparison between the average weight of consumptives and non-consumptives it is clearly and conclusively shown that a far larger proportion of cases under weight die of consumption than of those which more nearly conform to the American standard. This is especially the case with females. Of course it is an open question whether the standard is applicable to both males and females alike, which is probably not true.

The experience of the Prudential also conforms to the experience of the Sun Life of Canada, in that the American standard for the lower heights is unreliable; in that short men are, on the average, heavier than the theory would show.

An extended investigation on this point is now fairly under way and will probably be completed within a few weeks. The points brought out so far warrant the assertion that the American standard does not conform to the Prudential experience, and that Mr. Macauley is right in stating that "an average based on the experience of a Life Insurance company itself is preferable to any theory, however carefully devised." A careful study of the figures before me would indicate that the minimum as well as the standard is too low for males and not at all available for females.

Second.—Contrary to the generally prevailing opinion that the female mortality is in excess of the male, the Prudential experience for eight years in Special Adult Risks (Industrial Branch) gives a mortality for females of 13.78 per thousand and for males of 14.64 per thousand. The mortality from consumption is 3.60 per thousand for males and 2.96 per thousand for females.

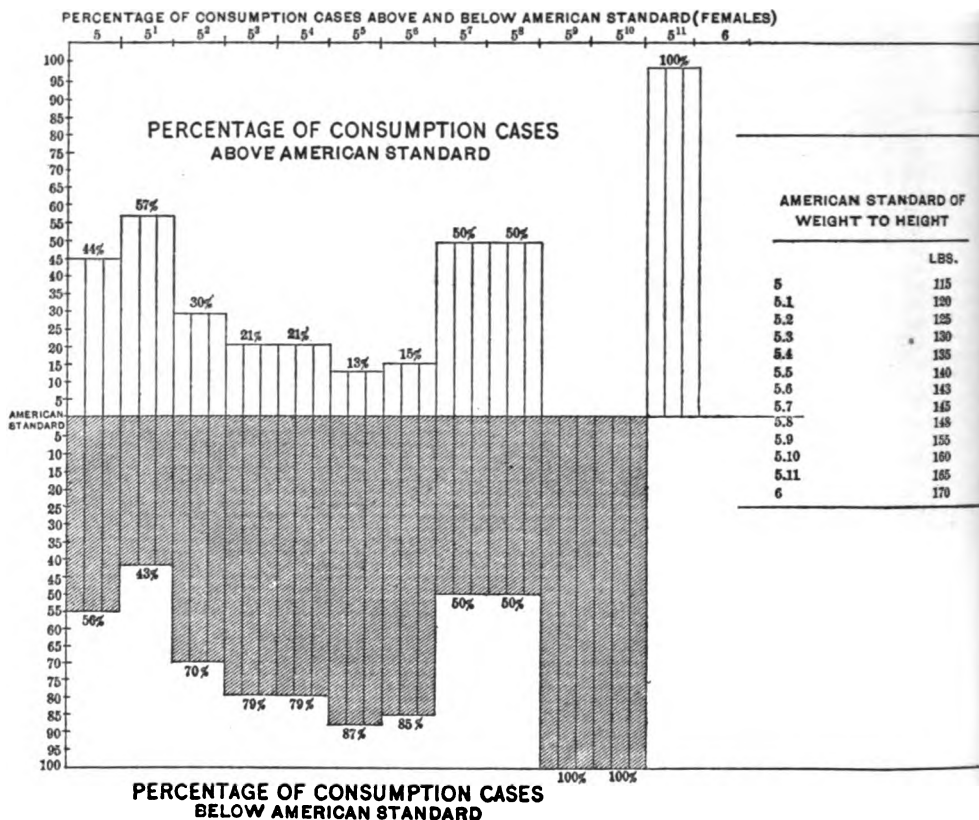
The mortality curve, as shown in the following diagrams,



makes it plain that only for the age period 20 to 30 is the female mortality in excess of that of the male. The general experience in four large cities of this country gives a lower

rate of mortality for females at all age periods than for males.

In the Prudential industrial experience deaths from old age are far more frequent among females than among males. The climacteric period does not seem to affect the general rate of mortality at those ages.



Third.—Without exception, the percentage of deaths with a tainted family history falls between the deaths with a clear family history and the deaths from consumption. This is shown in the average age at death as well as in the last table of the percentage of cases below standard weight.

In the last table, the position of a case with a cloudy record

is clearly defined in placing it next to our general mortality, regardless of family history and causes of death, and our particular mortality from consumption.

The same law applies to both males and females, and would seem to warrant the assertion that a case with a cloudy family history is more nearly allied to a case with a clear family record than one of consumption.

It was shown in the beginning that the percentage of deaths from consumption to all causes was 23.62, against a percentage of 27.82 deaths from consumption with a tainted family history to all cases with a tainted family history. The difference here of about four per cent. would seem to indicate the tendency to a higher mortality of a cloudy case over a clear case.

The experience of the Washington Life *in this respect* is almost identical with the experience of the Prudential. That is, given one hundred cases with a tainted family history, 28 per cent. will die of consumption in the Prudential and 27 per cent. will die in the Washington Life. But the fact is that other companies are favored with more reliable statements in regard to family history, although their experience in this direction is not supported by the figures of Drs. Williams, Cotton, and Hutchinson, which give an average percentage of about 35 cases of tainted records out of every one hundred of average experience.

There is one thing, however, which reduces the percentage of cases with tainted family history in the Prudential experience, and that is, the Prudential did not inquire except in regard to the immediate family history—no attention being paid to the diseases in collateral branches.

This is not the case with other companies, as is demonstrated in their published reports. Thus the Washington Life, out of 296 cases, had 3 cases of mother and father, 25 cases of one parent and one or more brothers and sisters, 29 cases of two or more brothers and sisters, whereas the Prudential had none.

Such exclusion would naturally reduce the proportionate per cent. of tainted cases to all cases.

According to Dr. Edward Squire, of the Royal Medical and Chirurgical Society (London *Lancet*, December 15th, 1894), 12 or 13 per cent. is the utmost value that can be given to heredity.

According to Dr. Rabagliati, 10 per cent. covers the dangers that arise from family history, and at least 90 per cent. arise from personal conditions.

A more rigid physical examination, especially in regard to height and weight, inspiration and expiration, and past medical history, would without question considerably reduce the present excessive mortality from consumption. If it is true, as Drs. Squire and Rabagliati state, that from 87 to 90 per cent. are not directly affected by the family taint, it stands to reason that a more careful physical examination will be productive of better results than the present unsatisfactory method of inquiry in regard to the family history of the applicant.

The theory that consumption is a hereditary disease is no longer accepted by the majority of the profession. If we investigate the mortality in any given city or state we find that in certain sections the mortality from consumption is far in excess of the same disease prevailing in other sections. In New York City, for instance, the general rate of mortality from consumption is 392 per 100,000 of population; in District A, of the 8th Ward, the rate is 497 per 100,000 of population; in District B, of the same Ward, the rate is 576 per 100,000 of population; against a death-rate of 272 per 100,000 in District F, Ward 22; of 216 per 100,000 in District H, in Ward 22, and of 210 per 100,000 in District I, Ward 22.

Now if consumption were strictly an hereditary disease, it would be natural that we should find about the same proportion of deaths in the different localities; but, on examination of the available data, we find that there is a direct relation between the mortality from consumption and soil moisture, elevation, over-crowding, occupation, and general unsanitary conditions.

These facts, taken in connection with the preceding statements, make a more seaching investigation of the personal

physical condition and environment of the applicant imperative. Recognizing the value of a family history record, practical experience seems to demonstrate the inability of the examiner to ascertain all the facts that ought to be known for positive conclusions on this point.

The result of this investigation is, therefore, negative in one sense—that is, as regards the value of family history as ascertained, but positive and emphatic as regards the need of more careful attention to the personal physical condition of the applicant and to his environment.

For very valuable aid in the preparation of this paper throughout, the writer is indebted to Mr. Frederick L. Hoffman, Statistician of the Company.

Dr. Marsh read a paper on the prospective values to be assigned to

FAMILY HISTORY, AGE, AND PERSONAL PHYSIQUE IN ESTIMATING A LIABILITY TO CONSUMPTION.

It was based upon the experience of The Mutual Life Insurance Company for the past fifteen years. During this period there had been over 22,000 deaths in that Company's risks, and from these there were selected all cases that gave any history at insurance of consumption in the family. The number of persons with this tainted record was 1,994; another set of 2,706 cases with "untainted record" was then selected, for the purpose of comparison. Each class was tabulated first according to the age at insurance and the cause of death, whether consumption or otherwise.

From these tables it appeared that the proportion of consumption mortality was greater among those with tainted than those with untainted record, and that this difference continued up to a late period of life. Taking the proportion among the non-tainted class as a basis, the history of taint

increased this proportion by about 30 per cent.—one-third. For instance: at ages twenty to thirty years, the consumption rate among the non-tainted was 28.5 per cent., among the tainted, 37.6 per cent.; at ages forty to fifty, non-tainted, 6.8 per cent., tainted, 9.2 per cent.; the proportion of increase being proximately the same in both periods.

The cases of tainted record were then tabulated according to the member or members of the family who had been consumptive. In a very few cases only had both parents been consumptive, and in these the experience had not been particularly unfavorable, and the same result was shown where a parent and a brother or sister had died. The proportion of consumption was greatest where two or more brothers or sisters had died; where one parent, or one brother or sister, had been consumptive the result was nearly equal.

Proceeding next to the consideration of personal conditions, the cases of each class were subdivided according as they were above or below the average weight, proportionate to their respective heights, and grouped according to their ages at insurance.

The table of cases with untainted record showed nearly *twice as many* deaths among those below than among those above the average weight, and this proportion prevailed at all ages.

The table of cases with tainted record showed a larger amount of consumption in both those above and in those below the average, but again there were *twice as many* consumptive deaths in those below as in those above the average weight.

A series of diagrams was prepared, illustrating these relative values of family history and personal condition, separately and combined. By these diagrams it was seen plainly that, while both the history of phthisis in the family and the condition of personal underweight indicate an increased liability to consumption, these factors differ considerably in the degree of their influence. The family history exhibits *much less* influence than the weight, and a good record of weight overbalances tainted family history. The combina-

tion of the two factors indicates the *maximum*, and the absence of both the *minimum* of susceptibility.

DISCUSSION OF DR. HAMILL'S AND DR. MARSH'S PAPERS.

Dr. Shepherd thought that the tendency at present is to regard the family history as of less importance than in former years. The experience of his company showed plainly that a careful selection based upon the family history had greatly reduced the mortality from consumption. All statistics based upon mortality reports are defective. We need to know the number of those who survive as well as those who die, and he was glad to see that Dr. Hamill had considered the subject from that point of view. His company was now tabulating its experience, taking all applicants under exposure, and this when completed would present a very large number of cases from which to draw conclusions. He felt satisfied, from his own investigation, that in the main the experience of the Connecticut Mutual would agree with that given by Dr. Hamill and Dr. Marsh. He had noticed one exception, where the element of a defective family history was combined with overweight. In these cases there was a tendency to early death, as well as in cases where the weight was below the ordinary standard. He pointed out the importance of a sliding scale of weights according to age, and urged upon the members a joint investigation of the standard table, and he offered his services in tabulating the material furnished by various companies.

Dr. Barrows was especially interested in the fact that female risks had been found in this study not to be particularly unfavorable. This was contrary to his own experience and to the general belief.

Dr. Curtis said that, in the experience of the Equitable, the element of weight had been found of greater importance than family taint.

Dr. Davis said that the experience of the Union Central had been in accordance with the view just expressed, that light weight was more important than a single case of

consumption in the family history. He also thought that persons very much over weight, with a consumptive family history, were undesirable risks.

Dr. Huntington expressed himself as much interested in Dr. Shepherd's suggestion, and said that his company would be glad to furnish its share of the cases. In his opinion a new standard of heights and weights was necessary.

Dr. Van Wagenen felt that the proposed revision of a standard table was very important.

Dr. Paddock called attention to the element of infection in consumption, and said that this ought to be taken into account in the selection of risks.

Dr. Rogers called attention to the importance of considering the migration of families in the United States. It often happens, among people living in the lowlands along the Mississippi, that several members of a family die of consumption. The family then moves to the West or North, into the high country, and thus changes its residence to one much more favorable to longevity. In the same way the longevity of families living at considerable elevation above the sea-level is increased by their taking up residence on the seaboard. It was important to consider the local conditions in the standard of height and weight. In the Southern States people were much more slender than in the Northern States, and the investigation of build should take this factor into account also.

Dr. Wells recognized the importance of a sliding scale in the consideration of the element of build—men being lighter in the earlier ages than in middle life. Women, too, are not as heavy in proportion as men.

Dr. Wilkins said that the Sun Life was governed by the principles laid down by Dr. Marsh in his paper.

Dr. Willard emphasized the point that the family histories as given to insurance companies were quite unreliable. His Company demanded certified copies of death returns in all cases where there were three or more members of a family who had died under thirty-five years of age. In one-half of the cases so investigated such causes of death as "Don't.

know," "Debility," etc., were found to come under the head of Phthisis.

Dr. Tabb had found that, particularly in North Carolina, a man rarely came up to the standard as fixed by the companies.

Dr. Hamill, in closing, did not favor the adoption of a new standard. It meant the undertaking of a tremendous task. Consumption was as common in proportion to one age as at another, and people of light weight were very much more subject to the disease than those of heavy build.

Dr. Marsh agreed with Dr. Hamill that it was hardly worth while to formulate a new table. If Dr. Shepherd wanted to do so he would do what he could to assist him, but did not think he would get much out of it.

SEVENTH ANNUAL MEETING.

The Seventh Annual Meeting of the Association of Life Insurance Medical Directors was held at the Hotel Jefferson, Richmond, Virginia, on April 30th and May 1st, 1896. Dr. Edgar Holden, President, in the Chair. The following members were present:

Drs. Brannan, Burrage, Campbell, Chapin (Home Life), Curtis, Clark W. Davis, Devendorf, Fisher, Grant, Hamill, Holden, Huntington, Lambert, Marsh, Morgan, Paddock, Rex, Rogers, Root, Tabb, Thorburn, Webb, Frank Wells, Wilkins, Winston, Wistar, and Wood. 27 members.

After an address by the President formally opening the session, an election of applicants recommended for membership in the Association was held, and the following were unanimously elected:

Dr. Charles E. Albright, Northwestern Mutual Life Insurance Company.

Dr. John Homans, 2nd, New England Mutual Life Insurance Company.

Dr. E. M. Northcott, Union Mutual Life Insurance Company.

Dr. Z. Taylor Emery, Manhattan Life.

Dr. Joseph Kucher, Germania Life Insurance Co.

Dr. Homans, 2nd, and Dr. Northcott, who were in Richmond, were brought in and introduced to the members.

The Minutes of the Sixth Annual Meeting and of the meetings of the Executive Committee were read, and after correction by inserting the words, "and age" (to the resolution regarding the standard tables of heights and weights, page 86) were approved.

The President then appointed Drs. Winston, Thorburn, and Rex a Nominating Committee to nominate officers for the ensuing year.

Dr. Morgan announced the death of Dr. Barrows of the Phoenix Mutual, and on motion a Committee was appointed to draw up suitable resolutions touching his death. Dr. Morgan was named as such Committee.

Dr. Holden announced the continued illness of Dr. Bernacki of the Germania, and Dr. Brannan was appointed a Committee to formulate the feelings of the Association.

Dr. Tabb, the Committee on Arrangements, announced that the Life Insurance Company of Virginia invited the Association to join that afternoon in a carriage ride around the city and luncheon at Lakeview Park; that the Life Underwriters Association of Virginia had extended an invitation to the

Association to join it in an excursion to Dutch Gap on the following afternoon, and that the dinner was to be held at the Hotel Jefferson at 9 P.M. on Friday, May 1st. On motion the invitations were accepted with the thanks of the Association.

The Committee on preparing a standard table of heights and weights and dimensions of chest and abdomen at different ages (Dr. Shepherd, Chairman, Dr. Brannan) reported through Dr. Root on behalf of Dr. Shepherd that a large amount of data had been accumulated and was now being tabulated, and that the result would be reported to the Association at an early date. On motion the report was accepted and the Committee continued.

Dr. Hamill moved that a formal invitation be extended to the President and Vice-President of the Life Insurance Company of Virginia to meet the Association at the annual dinner. The motion was carried.

On motion, those physicians of Richmond who had shown conspicuous courtesy to the Association, were also invited on behalf of the Association.

Dr. Wells moved that the thanks of the members of the Association be extended to the members of the clubs of Richmond who had offered the hospitalities of the clubs to the members of the Association. The motion was carried.

The meeting then adjourned to meet at 10 o'clock on the following morning, May 1st, 1896.

SECOND DAY.

At 10 A.M. the meeting was called to order by the President.

An Amendment to the Constitution was submitted by Dr. Curtis: "When, from any cause, a member ceases to be a Medical Director of Life Insurance, his membership shall lapse by that circumstance."

This was laid over for action at the next meeting in accordance with the provisions of the Constitution.

Dr. Morgan reported the following resolutions on the death of Dr. Barrows, which on motion were adopted:

Dr. A. W. Barrows, late Medical Director of the Phoenix Mutual Life Insurance Company, died in Hartford, January 3rd, aged seventy-nine years. He was associated with the Phoenix from the date of its organization, and in 1853 became its Medical Director, which office he filled to the entire satisfaction of the company up to the day of his death. With what honesty, conservatism, and painstaking care he performed the work entrusted to him, his exceptionally long service throughout the changing administrations of the company gives ample evidence. He was modest and retiring in his nature, of great simplicity of life, which was in a measure forced upon him by his delicate health. In his death the Association of Life Insurance Directors has lost one of its earlier members, who followed with appreciative interest its development, and entered into all its plans for the furtherance of our special work. We desire to place upon record our appreciation of the loss our Association has sustained in the death of Dr. Barrows, and to extend to his family our sympathy in their bereavement.

Dr. Brannan reported the following resolutions on the illness of Dr. Bernacki, which on motion were adopted:

The Association of Life Insurance Medical Directors has learned that Dr. Chas. Bernacki is prevented by illness from filling his office of Medical Director of the Germania Life Insurance Company, and from taking part in the proceedings of the Association.

Dr. Bernacki was one of the original members of the Association, and was the first member to present for its consideration a paper of scientific interest.

Dr. Bernacki was also distinguished for his good fellowship, and contributed largely to the enjoyment of our annual meetings.

The Association therefore desires to convey to Dr. Bernacki its sincere sympathy with him in his affliction, and to express the hope that he may soon be able to take up his professional work, and to rejoin the ranks of the Association.

Upon the report of the Nominating Committee (Dr. Winston), a ballot was taken and the following officers declared elected for the ensuing year:

PRESIDENT.

DR. EDGAR HOLDEN.

1ST VICE-PRESIDENT.

DR. H. CABELL TABB.

2ND VICE-PRESIDENT.

DR. J. H. WEBB.

SECRETARY.

DR. O. H. ROGERS.

TREASURER.

DR. J. W. BRANNAN.

EXECUTIVE COMMITTEE.

DR. EDWARD CURTIS, DR. A. HUNTINGTON,
DR. G. R. SHEPHERD, DR. ALBERT WOOD.

Dr. Albert Wood read a paper on

APPENDICITIS AS IT AFFECTS LIFE INSURANCE
RISKS.

No disease has assumed more importance in recent years, or excited greater interest in the medical profession, both at home and abroad, than appendicitis. It has been studied by the ablest physicians and surgeons in this country and in Europe, and their contributions have followed each other in rapid succession, so that now its literature has become voluminous.

From such abundant material, one would think that the necessary data could be easily collected to show the relation which this disease bears to life insurance; but I have studied many of the scholarly articles upon this subject, published within the last ten years, and I have failed to find just the information needed to enable me to form an intelligent conclusion.

Wells published in the *Medical Examiner*, in November, 1894, a valuable paper on "Appendicitis and Insurance" that contained many important facts, a knowledge of which is necessary to appreciate fully the bearing of this disease upon insurance. Besides this, I have found scattered through the medical journals only one or two short items in which any allusion has been made to this disorder, from an insurance standpoint.

To obtain exact information, I addressed a letter of inquiry to the various companies, to learn the practice of each in dealing with an application of a person giving a history of appendicitis. The replies showed such a remarkable difference in the methods of the several companies in deciding upon this class of risks that I was strongly impressed with the importance of bringing this subject before this Association for discussion, and with the necessity of our trying to formulate some uniform rules for the guidance of all the companies.

In this circular letter there were six questions. The first was: How long after an applicant has recovered from a mild

or catarrhal attack of appendicitis, before you consider him eligible for insurance?

Three companies replied: "We decline all, unless the Appendix has been removed." Another answered: "Ten years." Another said: "Six months." The other companies variously fixed the limit between these two extremes. No two companies, excepting those which declined all, gave the same answers to the six questions submitted. For this wide difference in the rulings of the several companies I can offer no satisfactory explanation.

Many persons who have had appendicitis are now seeking life insurance, and no doubt the number will be much larger in the near future.

The question of the eligibility of this class of risks is one which is comparatively new to us, and its definite solution may not be possible at the present time. It may be necessary for us to wait until a larger clinical experience furnishes us with more accurate knowledge of the natural course and the ultimate outcome of the disease, or until the differences of opinion among the physicians and surgeons upon some of the points in its pathology, prognosis, and treatment have become settled. Even with the knowledge now at our command, we ought to agree upon some uniform mode of action, which will do injustice neither to the applicants nor to the companies which we represent.

I have not attempted to collect from the several companies the number of policy-holders whose deaths were attributed to appendicitis and who had a history of having had the disease at the time of being insured, for I thought that even the combined experience of all the companies would be so limited that it would not be of much value for the purpose of this study.

I have seen no statistics showing the frequency with which inflammation of the appendix occurs. That it is quite common we all know. The statement often seen, that at least one-third of all post-mortems made upon adults at random give evidence of old inflammatory lesions of the appendix, indicates as clearly as anything the frequency of this

ailment. Some of the expressions used by those surgeons who have so forcibly advocated early operations in all cases would lead us to infer that they believed that this disease was unusually frequent at the present time. It is generally thought, however, that more cases of appendicitis are seen nowadays than formerly, simply because the profession has learned to recognize its true nature.

It appears oftener in men than in women, four to one, according to Fitz's first series of cases, but in his second series the proportion is two to one. The Munich statistics, however, show relatively more women than men affected.

There are no observations which indicate the exact mortality of this affection. Fitz says: "The rate of mortality is by no means clearly established. The physician who sees only mild cases says it is low, while the surgeon who is called upon for aid in the gravest cases considers the mortality very high."

Bridges writes: "The mortality from appendicitis, considering the frequency of it, cannot be regarded as great. The mortality of those cases eventuating in perforation of the appendix is, however, great."

Richardson, of Boston, writes: "Excluding certain zymotic diseases, it causes more deaths than any other abdominal lesion. The number of deaths from appendicitis, in which the true cause is not even suspected, is, I have no doubt, very large. If we take the returns, however, and select those cases where death has been caused in males under forty by 'inflammation of the bowels,' we should get an approximate estimate of the number of deaths from this disease. It is only by collecting a large number of cases from many observers that the true death-rate can be determined. This I have not attempted to do."

Let us look now at a few statistics. In his second series of cases, Fitz gave the number of those who died as 26 per cent. Porter, of Fort Wayne, collected 448 cases, in which the death-rate was 17.23 per cent. Sahli reports 7,213 cases treated by 446 Swiss doctors; only 476 were operated on; of those not dealt with by operation only 8.8 per cent. died. Richardson gave me his personal experience in 401 cases, with

a death-rate of 13.4 per cent. Hawkins states the death-rate of 264 cases admitted into the St. Thomas Hospital, London, as 14 per cent.

Ferguson says: "I see on an average about twenty cases of well-defined appendicitis each year, and out of this number about four would come to an operation. All the patients would get well, and the vast majority would remain well."

Bryant says: "Undoubtedly from sixty per cent. to eighty per cent. of the cases would recover from primary attacks without operation."

White writes: "Perhaps eighty per cent. of the cases of this type (catarrhal) recover under medical treatment. Of the remaining twenty per cent., at least one-half can be saved by operation during the condition of localized abscess, which occurs in probably that proportion of cases; of the remaining ten per cent., in which no protective adhesions would form, a certain indeterminate proportion recovers after operation, before septic peritonitis and intestinal paresis has occurred. This would leave a death-rate of say five per cent. to eight per cent." (Wells).

If we examine the recent reports of those surgeons who believe that this disease should always be treated as a surgical one, and who have so vigorously pleaded for an operation in all cases as soon as a positive diagnosis has been made, we shall find that the death-rate has been remarkably reduced. Deaver states that he has made two hundred consecutive operations, without any death; and Morris has recently published the results of one hundred consecutive operations, with only two deaths. These included all forms of the complaint. The reports of other surgeons show equally good results. Wyeth writes to me: "I have seen very few cases of death from relapsing appendicitis. I think this is accounted for by reason of the adhesions which form and include the first inflammatory focus, mechanically retarding the rapid infection of a recurring inflammation. I believe if every case of appendicitis were operated upon by a competent surgeon within twelve hours of the first symptoms of well-marked emigration

of infectious organisms through the diseased or perforated wall, the death-rate would not be over one per cent."

Richardson, who does not advocate operations in all cases, said to me that he had had seventy-five consecutive operations with no fatal results. Even general peritonitis, which is so much apprehended and dreaded as a result of an inflammation of the appendix, and which has always been considered to be almost surely fatal, until quite recently, has lost its terror in a measure, so that now a large per cent. of these cases recovers. McBurney has given us the records of his operations for diffuse suppurative peritonitis occurring as a result of appendicitis. Out of twenty-four cases, fourteen recovered. Albee saved three out of seven similar cases. Hawkins gives nine recoveries in thirty-six cases, some without operation. Richardson reports nine recoveries in thirty-two cases.

When we review the rapid progress made by the American surgeons in the treatment of this malady in the last few years, with its brilliant results in the saving of life, it is not unreasonable to anticipate that in the near future, with this improvement in the treatment still continuing, its death-rate will become quite low.

I have dwelt upon this question of mortality because it is important that we should have a proper appreciation of the dangers to life resulting from appendicitis. Especially is this true when we consider the remarkable tendency of this disease to return, and the possibility that the subsequent attacks may be followed by the same fatality as the primary one.

In studying this disease as affecting life-insurance risks, we need to recognize only non-suppurative and suppurative appendicitis.

NON-SUPPURATIVE APPENDICITIS.

I will briefly review some of the essential features of this type of the disease. It has been stated by some observers that about eighty per cent. of all cases seen are of this form. The percentage of recoveries after the first attacks is variously

given. Death is rare, and occurs only when general peritonitis or some other serious complication supervenes. The pathological changes in the appendix may be of the slightest, or they may be such as to leave the organ permanently diseased, or its lumen may become partially or completely obliterated, and the organ converted into a fibrous cord. It may be the seat of tuberculosis or other morbid conditions. Adhesions may be formed, of various extent and importance, which have been found to be the cause of some of the remote after-effects of the disease. There may be only one attack, or one or more subsequent attacks may occur at short or long intervals. Complete and permanent recovery may follow the primary or any of the succeeding attacks; or it may not take place until the appendix has been removed. Septic general peritonitis, or other serious complications, may appear. It is believed by many eminent surgeons that the appendix once severely or mildly inflamed is ever after a diseased structure, which is apt to give rise to serious trouble at any time in the future, and that it is a risk to the life of the patient to leave such an infected organ within the abdominal cavity. Many equally prominent in the profession have not accepted these extreme views.

It is in this variety that most of the relapses and recurrences are seen. Fowler states so clearly the distinction which should be made between the chronic relapsing and the recurring forms that I quote fully his words. He writes of the former: "The patient may become seemingly convalescent, in that all pain and febrile symptoms disappear. He may even be permitted to resume his vocation. Within a few weeks, or even earlier, a relapse takes place, with the symptoms perhaps more violent and threatening than at first. There is one symptom, at least, which does not entirely disappear, and its presence should always place the attendant upon his guard against this form of the affection. I allude to the symptom of persistent tenderness. This is sometimes accompanied by the presence of a tumor, although the latter is not an essential symptom of this type of the disease."

He says of recurring appendicitis: "The special feature of

this form is the fact that the attacks occur at long or short intervals, suggesting some predisposing cause, which continues active after recovery from the first attack. It differs from the relapsing form of the disease in that entire recovery takes place. The patient remains free from any trace of the affection for varying periods, when suddenly and without any warning, he is subjected to another attack."

In some cases the interval between each succeeding attack becomes longer, its severity decreases, and finally the disorder ceases altogether, so that the patient is restored to health and is ever after as free from the risk of future trouble as if the appendix had been extirpated. This occurs when the lumen of the appendix has become completely obliterated. In those cases of appendicitis obliterans reported by Senn, in which ablation of the appendix showed only partial obliteration of its lumen, the relapses were frequent, and there was local discomfort or tenderness remaining during the intervals, as in the chronic relapsing form described by Fowler.

The two features of this type of appendicitis which make it of peculiar interest to life insurance companies are its tendency to recur and its possibility of passing suddenly into the severe forms of the disease, either at the first or any subsequent attack.

The statistics showing the liability to second attacks are far from being satisfactory. The following figures will show the percentage of relapses and recurrences, as given by a few observers. Fitz, in his first series of cases, stated it as 11 per cent.; in his second series as 44 per cent., and in a recent conversation I had with him, he said: "A relapse is as likely to occur as not." Irish gave 50 per cent.; Richardson, 49.4 per cent.; Price, 50 per cent.; Ransohoff, 13 per cent.; Kraus-sold, 23 per cent.; Krafft, 22 per cent.; Porter, 9½ per cent.; Bryant, 11 per cent. to 17 per cent.; Sahli, 20 per cent.; Gage, 33½ per cent.

Gage writes: "Almost 33½ per cent. of my cases had previous attacks. This is by no means equivalent to saying that 33½ per cent. of all cases will have relapses, and I do not think this last proposition a fair one."

Mynter writes: "I firmly believe that a patient who has had one moderately severe attack is bound to get another sooner or later."

Morton writes: "A careful inquiry will usually demonstrate one or more relapses."

Meyer says: "It is the duty of the physician to follow up these cases, to determine how many remain actually well after one attack. I do not believe that twenty per cent.—no, not more than ten per cent., would be found to remain healthy."

Wyeth writes: "From clinical experience, it is known that a considerable number of cases of appendicitis, with more or less peritonitis and exudation, and at times with suppuration, undergo spontaneous resolution, the patient being usually restored to health, and living indefinitely without a recurrence of the disease. It may be safe to say that twenty per cent. of all cases have such a fortunate end."

I thought that if I could collect a large number of cases showing the exact time at which the second attack occurred, I should then be able to determine the time within which a majority of second attacks appeared. The published reports of cases do not give the exact time of the second attacks, except in a few instances. Probably there is stored up in the note-books of the many observers just this information, and, if it were only accessible, it could be utilized in clearing up some of the doubtful points in this investigation. Accordingly, I wrote to several physicians and surgeons asking for such data. From their replies, and from those published cases which I have had time to examine, I have been able to collect 326 cases in which the exact time of the second attack was stated. In 210 cases, it appeared before six months; in 60 cases, between six months and one year; in 14 cases, between one year and eighteen months; in 13 cases, between eighteen months and two years; in 11 cases, between two and three years; in 3 cases, between three and four years; in 2 cases, between four and five years; and in 13 cases, after five years.

From these figures, it is seen that 64.4 per cent. of the

second attacks occurred before six months; 82.8 per cent. before one year; 87.1 per cent. before eighteen months; 91.1 per cent. before two years; 94.9 per cent. before four years; 96.5 per cent. before five years, and 3.3 per cent. after five years.

These statistics, so far as I know, are the only ones of the kind collected up to date, and they must be accepted as establishing the time within which second attacks have appeared. The study of a larger number of cases, no doubt, would alter these percentages somewhat, but still the fact would probably remain that in a large majority of the cases the relapses take place, if they are going to occur at all, within two years after the primary lesion. The same opinion is expressed by those surgeons who replied to my question, without giving me exact data.

Cabot writes: "In regard to your second question, I should say usually, if a patient relapsed, he did so within a year, although I do not feel that I could lay down a positive rule in regard to this. In cases which have gone over two or three years, I should say I have almost never seen a relapse. My experience covers several hundred cases."

Morton writes: "From thirty days to a year or more."

Mixter says: "Within two years."

Gage says: "In my experience, a large majority have occurred within two years if at all, and mostly within one year."

The other replies received gave the number of relapses seen in each case, instead of the time of the second attack; so they are of no value for my purpose.

SUPPURATIVE APPENDICITIS.

It is in this variety that nearly all of the grave cases are seen, and they are usually the result of perforation of the appendix. Should this perforation take place before protective adhesions are formed, then general septic peritonitis is rapidly excited, with fatal consequences as a rule, or there may be diffuse peritonitis without perforation. It is this large death-rate from peritonitis which makes this form of the disease so much dreaded, though with prompt surgical inter-

ference more cases recover now than in times past. When protective adhesions are formed before perforation occurs, then there is the formation of a localized abscess, the result of which, if relieved by skilful surgical aid, is almost always favorable. If the abscess is allowed to rupture itself, the course of the pus may be externally, or into some internal viscus, or into the peritoneum, causing diffuse peritonitis. In those cases in which the appendical abscess forms behind the cæcum (extra-peritoneal) the pus may pass in various directions. The most favorable place for the abscess to discharge is into the bowel, and next into the bladder. When into the former, nearly all recover, and when into the latter, fifty per cent. In a large percentage of the cases, the appendix is so changed in character by the attack, or is so embedded and bound down in the adhesions, that no further harm can result to the patient. Again, the appendix may slough entirely away, and consequently the patient will be as exempt from a subsequent attack as if the organ had been excised.

In the circular letter sent to the physicians and surgeons, four questions were asked under the following head: In the suppurative cases, in which the abscess was opened and drained without the removal of the appendix,

- (a) What has been the percentage of relapses in your cases?
- (b) Within what time did the second attack appear?
- (c) Have you seen more than one relapse in any one case?
- (d) Is the subsequent attack as liable to be followed by so serious results as is the primary one?

I have transcribed the answers received.

(a) "Some have chronic infection, not assuming forms of attack; others have acute exacerbations" (Morris). "None" (Mynter). "One in about twenty-seven cases" (McGuire). "None, so far as I know" (Homans). "I can recall two in seventy-five cases" (Gay). "In no case" (Morton). "Out of seventy-nine cases, four had return of the disease" (Richardson). "I have operated on at least two cases in which previous suppuration had occurred and had had an operation" (Stimson). "None" (Irish). "I cannot give the exact number, but I should say several" (Mixer). "Have had one

case" (Gage). "None" (Porter). "I have seen several relapses" (Cabot).

(b) "Two, two weeks after the operation; one, six weeks after, and one had four operations in nine years" (Richardson). Time not stated by Stimson. "Within a short time" (Porter). "Within six months" (McGuire). "Within a year" (Mixer). "Five years after the first operation" (Gage). "I cannot say within what time the second attacks appeared, but usually, I should say within a few months" (Cabot). "Two years, both cases" (Gay).

(c) "Yes, several" (Morris). "No" (McGuire, Homans, Gay, Porter, Mixer, Gage). "Yes, one had two relapses" (Stimson). "I have seen several relapses; in one case, certainly three" (Cabot).

(d) "I think so. It was certainly so in the two cases seen" (Stimson). "I should say that subsequent attacks usually appear as abscesses at a point along the old line of operation, and are, therefore, not so serious as in the first attacks" (Cabot). "I should think so" (McGuire). "No" (Porter). "No. General peritonitis is not likely to occur, because pus will travel along the old channels" (Gage). "Yes. No difference" (Morris). "No" (Mixer and Gay).

Richardson, in a recent conversation with me, said: "No. The most dangerous form is when the appendix hangs freely in the peritoneal cavity. In the abscess cases, as a rule, the appendix is bound down by adhesions, so that general peritonitis is not so likely to occur, and death following second attacks is rare."

It will be seen from the above answers that while several relapses have been observed, they cannot be said to be very frequent; that while two were stated to have appeared more than five years after the initial attacks, all the others were within two years, and most of them within a few months; and that, in the opinion of some of the surgeons, the subsequent attacks are as likely to be followed by the same serious consequences as in the primary one; but that others have expressed the belief that there is not this danger to be expected, and have very clearly given their reasons for this opinion.

In a recent discussion before the New York Surgical Society, Stimson said: "The generally accepted idea was that after one attack of suppurative appendicitis, sufficient changes were set up in the neighborhood to render the patient exempt from the risk of further attacks. Two cases had occurred to him recently, however, that indicated that this was not necessarily the case, since one patient, after what had been undoubtedly two attacks of suppurative inflammation, presented himself for the cure of a resulting hernia, and on operation it was found that the appendix was free within the peritoneal cavity and practically devoid of adhesions."

Bryant and Fowler fully corroborated Stimson's statement, that frequently after an attack of suppurative appendicitis the appendix was as fully capable of originating another attack as formerly. Rushmore was of the opinion that such cases did occasionally occur.

I have quoted this in full, because it gives quite clearly the two opposite views held by the profession upon this point at the present time.

To my question, "Have you seen a recurrence in any form after the appendix has been excised?" I received one answer in the affirmative. Morris writes: "Yes, where more than one inch of the appendix was left in." A few cases have been reported of second attacks after the appendix had been removed, usually the result of improper treatment of the stump.

THE REMOTE COMPLICATIONS AND AFTER-EFFECTS.

A patient may have entirely recovered, to all appearances, from the immediate effects and complications of the disorder; still he is in danger of having certain other sequelæ develop at any time in the future. The remote after-effects which are most frequently seen are an obstruction of the bowels in its various forms from adhesions, and peritoneal tuberculosis. Other sequelæ have been observed.

It is generally thought that adhesions once formed are permanent; but several operators have shown that when a second laparotomy has been required, as for the cure of a ventral

hernia, the adhesions have been found in many instances to have disappeared.

If no symptoms of obstruction have appeared within a certain period after recovery, can we assume with any reasonable certainty that the probability of these symptoms developing at all is quite small? If so, at what time after recovery would you fix this limit?

To these questions I received the following replies. Cabot: "I do not think we can ever rule out, with any certainty, the possibility of obstruction occurring a long time after an attack, as it is impossible to tell what bands have formed. It has been my experience, however, that adhesions usually disappear after the cause of irritation has been removed, so that, if a patient made a complete recovery, I should not expect any further trouble from adhesions after they had been a year in reasonable comfort." Homans says: "Yes. Perhaps one and a half years." Gage says: "Yes. I should think one year a liberal limit." Irish writes: "I have not seen a case of obstruction after recovery from operation." Morton says: "Yes. Quite safe at four or six months." Mynter says: "Yes. I believe there is very little probability of its developing." Morris writes: "Not without operation to determine the form of the adhesions." Porter says: "Yes. I think thirty days a safe limit." McGuire says: "Quite small after six months." Stimson says: "In cases operated on, with removal of the appendix, the chances of future trouble are very slight." Mixter says: "Yes. Two years." Gay says: "Yes. Six months." Richardson writes: "Yes. Six months."

The question, Would obstruction of the bowels be more likely to occur after a general than after a local peritonitis? was answered by a large majority of the surgeons in the negative.

It will be seen that, in the judgment of these observers, the probability of the obstruction of the bowels occurring after two years is very slight.

The danger of hernia following an operation in abscess cases is great, but in non-suppurative cases, when drainage is not required, this danger is quite small. A few cases of

strangulation in this kind of hernia have been reported, though the possibility of such an occurrence is not large. The condition is one more of discomfort than of danger to the patient. The rupture can be entirely cured by a second operation as a rule.

Time will not permit me to consider tuberculosis of the appendix, or of the peritoneum, following this ailment; nor will I mention the other remote complications which may develop.

Of the other forms of abdominal disease which have been mistaken for appendicitis, it is not necessary for me now to speak. It is enough to recall to your mind that long list of morbid conditions given by Dennis, in which a wrong diagnosis was made.

APPLICATION TO LIFE INSURANCE.

An applicant who has had appendicitis is an impaired risk, but with such a history he is not absolutely ineligible for insurance. Under what conditions is he insurable?

He should have completely recovered from the disease; in all other respects he should be up to the standard of physique and health usually required, and a sufficient time should have elapsed after the attack to show that the probability of the return of the trouble, or the development of any of its remote after-effects, is reasonably minimized.

To determine whether he has fully recovered from the ailment, we must rely wholly upon the opinion of our local medical examiner, and much will depend upon the care and thoroughness with which he makes the examination.

He should obtain a full history of the case, the date of the attack, the form of the disease, its severity and its treatment, whether there were any previous attacks or any symptoms which might be construed as such. He should inquire as to any symptoms of indigestion, pain, or constipation. He should scrutinize the abdomen with care for any evidence of tenderness remaining, of dilatation of the cæcum, of a hernia, of a fistula, or of tuberculosis. When practicable, he should employ the method recommended by Edebohls for the

examination of the appendix. If the applicant is a female, then, in addition to the above, the condition of the uterus and its appendages should be carefully noted.

When possible, so much of his statement as relates to the history and treatment of the case should be corroborated by the attending physician or surgeon.

Many of our medical examiners have a proper appreciation of the importance of an attack of appendicitis from an insurance point of view, and obtain all the above facts and report them to the home office; but I am sorry to say that there are some examiners who merely make the statement that the applicant has had the ailment, without giving any further information.

It would seem advisable, therefore, in all cases of this class of risks, that a special letter of inquiry should be sent to the local examiner, requesting such details as may be desired.

How long after a person has recovered from an attack of appendicitis, before he should be considered eligible for insurance?

A different answer can be given to this question at the present time from what could have been made ten or even five years ago, for we have a more accurate knowledge of the natural history and prospective consequences of the disorder, and its proper method of treatment is better understood, and therefore more successful; so that the general results to the companies will undoubtedly be much more favorable now than formerly.

The following classification will probably include all of the different phases of the disease which we shall be called upon to decide as affecting life-insurance risks:

1. Cases of primary attacks of non-suppurative appendicitis, in which the appendix was not removed.

In this class of risks, the dangers to be guarded against are the return of the disease with its possibilities, and the development of some of its remote after-effects. The statistics show that the second attack occurred before one year in 82.8 per cent. of the cases, before two years in 91.1 per cent., before three years in 94.4 per cent., before four years in 94.9 per cent., be-

fore five years in 96.5 per cent., and after five years in 3.3 per cent.

Those surgeons who could not report their cases showing the exact time at which the second attack took place, but did give their impressions from the study of several hundred cases, used expressions on this point as follows: "We should say usually, if the patient relapsed, he did so within a year. In cases which have gone over two or three years, we should say we have almost never seen a relapse." They also expressed the opinion that if a patient went one year without any of the remote after-effects of the disease developing, the probability is quite small that they will appear later.

Now if the second attack takes place within two years in 91.1 per cent. of all the cases, there is less than one out of ten chances that the disease will return after two years.

I have not been able to collect any reliable data showing the death-rate in those cases which relapsed after two years. It certainly must be quite low. This statement is confirmed by several surgeons. It would seem reasonably safe, therefore, to accept this class of risks after two years.

2. Primary non-suppurative cases with the appendix excised.

In this class the recurrence of the disease is not to be expected, but the other remote after-effects are to be apprehended. It has been shown that the adhesions disappear in many instances after ablation of the appendix, consequently obstruction would not be so likely to occur as in the first class. Cases of this kind should be insurable after one year.

3. Suppurative cases in which the appendix has been extirpated, or in which it can be clearly proven that it has sloughed entirely away.

It may be very difficult to decide the latter point absolutely in some of the cases. The remote consequences from adhesions to be anticipated in this variety would be the same as those in class 2, and I can see no reason why the same rule should not be adopted for both classes.

4. Suppurative cases in which the abscess was opened and drained, the appendix not being removed.

From the data obtained, it appears that in this type of the disease a recurrence was observed in less than one out of twenty cases; and with only two exceptions the second attack occurred within two years, and mostly within a few months after the previous one.

While all of the authorities state that there is a possibility that any subsequent attack may be followed by serious consequences, still several surgeons who have had large experience with appendicitis inform me that, as a matter of fact, death is very rare after these relapses.

It would seem, therefore, that the risk of a fatal issue in any case after two years would be slight. Cases of this kind might be accepted for insurance after two years.

In those cases in which the abscess ruptures internally, each one must be judged upon its merits. Many of these cases make a perfect and permanent recovery, and are justly entitled to insurance.

5. Chronic relapsing and recurring cases.

An applicant with a history of chronic relapsing appendicitis would be debarred from insurance, because he does not make a full recovery between the attacks. When it can be decided that in all probability the appendix has become obliterated, then he should be insurable. He should be required to wait three years after the last attack before he should be considered eligible.

I find it very difficult to arrive at any just conclusion in regard to those cases in which the recurrence has been at irregular intervals, the patient having been in perfect health and free from any symptoms of the disease between the attacks.

It has been stated that the patient appears to have some predisposition to the disease, and that the attacks are excited by errors in diet, over-exertion, etc., or there is an underlying rheumatic or gouty tendency, as when the ailment has occurred in more than one member of the same family.

This type, as a rule, is not liable to pass suddenly into the grave forms of the disorder. If a person gives a history of two or more attacks, at periods of less than five years apart,

he should be declined; but when he has gone over five years without a recurrence, it is a question in my mind whether we should be assuming any more risk in accepting such a case than we take every day in some other diseases. Each case, however, must be judged according to the facts submitted. The age of the applicant would be an important factor in enabling us to form a decision.

6. Cases which have recovered from general peritonitis, either with or without an operation, the appendix having been excised or not.

It is generally thought that very few patients survive such an attack, but recovery does occur; and under modern treatment the number which gets well is increasing. Are the remote consequences of adhesions more likely to develop after a general than after a local peritonitis? Upon the answer to this question we should base our decision as to the eligibility of this class of risks.

The replies received from the majority of those surgeons to whom this question was addressed, indicate that there is no difference in the liability between the two forms of peritonitis. Whether there is greater danger of the development of some of the other remote after-effects, as abdominal tuberculosis, after a general than after a local peritonitis, I have no means of knowing. With the appendix unremoved, second attacks of peritonitis have been observed. Richardson reports a fatal case which occurred three years after the first peritonitis.

I can see no good reason why the same rules should not govern this class as those given for classes 1 and 2, excepting that a patient who has had a severe attack of general peritonitis has a protracted convalescence as a rule, and therefore a longer time would be required to establish perfect health than after a milder form of the disease; and, besides, there may be a greater risk in this class of cases.

Taking the above facts as a basis upon which to form an opinion, I should say that cases of this class were eligible for insurance after one year when the appendix has been excised, and after three years when it has not been removed.

7. Cases of hernia following an operation.

These should be classified with other kinds of hernia, though it has been said that strangulation is not so liable to occur in this type as in the other varieties. The applicant should be required to wear a suitable support.

The above recommendations seem to be justified by the facts obtained from studying the literature of appendicitis, and from the opinions expressed by those physicians and surgeons who have so kindly given me the benefit of their large experience with the disease.

The rule "to decline all applicants with a history of appendicitis, unless the appendix has been removed," is, in my judgment, too stringent; and, on the other hand, the rule to accept an applicant after six months with such a history, the appendix not having been excised, is too liberal, as it is assuming too great a risk, excepting perhaps in the very mildest cases of the disease.

While the former rule may more safely guard the company, so far as the death-rate is concerned, it will at the same time deprive many persons of the benefits of insurance to which they are justly entitled; and, besides, it will turn away an amount of business which should be retained.

The company may often suffer as much injury when an injustice is done to the applicant, as when by an error of judgment a doubtful risk is approved.

I am not strenuous that these recommendations shall be adopted by the Association in just the form submitted; but it is my earnest hope that we may be able to formulate some rules which will be uniformly used by all the companies in dealing with this class of risks.

A general discussion followed, which was participated in by Drs. Grant, Marsh, Brannan, Lambert, Wilkins, Wells, Devendorf, Paddock, and Fisher. The value of the paper as furnishing a guide to detection in these doubtful cases was commented upon by all, and by resolution the thanks of

the Association were offered to Dr. Wood for his contribution to our knowledge of the subject, and on motion the paper was placed in the hands of the Executive Committee for such disposition as in its opinion would conduce to the best interests of its author and the Association.

Dr. Edgar Holden then read a paper on

THE DEFEAT OF HEREDITY.

Every individual is a complex piece of mechanism resulting from the contribution of a multitude of progenitors.

Like a clock he starts, made and wound up to run a given length of time.

Like a day- or a week- or a year-clock, he may fall short by little or much, or exceed the ordained time by a fortunate perfection of mechanism, or even resemble the timepieces which, by adaptation of special device, or changes of temperature, are to some extent self-winding.

Here the analogy ceases; unlike the inanimate machine, man is, to a large extent, regenerative.

Gifted with intelligence, he may care for and preserve the delicate organization entrusted to him, or he may weaken or destroy it long before it could wear out in the course of nature.

The problem I ask you to consider is this: Can a man, whose infinitely complex being is derived from degenerate ancestors, defy and defeat a baneful inheritance?

What has been said of his power to preserve and lengthen the running period of his mechanism does not forestall the answer, for by defeat of a baneful inheritance we mean the acquirement of immunity from ancestral taint, and of a fair longevity, notwithstanding an apparent failure in his immediate progenitors.

THE QUESTION OF IMPORTANCE.

That we may waste and destroy an inheritance of potential vitality, as well as of property, is unquestioned. Can we

defeat that of a fragile constitution and tendency to disease as readily as we know we can that of poverty or evil environment?

The question is one of vital importance to vast numbers of the human race.

To paraphrase it: Is there any use for the feeble, scrofulous child, with his already inflamed glands, his capricious appetite, his uncertain digestion, and his limited endurance, striving to be strong, useful, or great?

Must the child of insane parents look forward with anxiety to the days when illness or privation or over-tension will bring to him the same alienation and the same awful madhouse or suicide?

The Spartans settled the matter most summarily. All infants were submitted to a council of old men. If they proved robust and strong or wiry and tough they were allowed to live. If puny or ill nourished or diseased they were destroyed.

If the Spartans thought it possible to defeat a feeble inheritance they could not have thought it worth the trouble.

According to the doctrine of "natural selection," nature follows the same plan by slower methods. Individuals best fitted for the struggle of life are preserved for the continuance of the race

DISCOURAGING FEATURES.

Modern biological investigations and the resultant theories tempt us at times to adopt the "kismet" of the Turk or to fall back in dismay at the glimpse of cruel, unbreakable chains by which we seem to have been forever bound. For the idiot, the imbecile, the epileptic, and the hereditary criminal, there seems indeed no hope. A writer in the *Medical Record*, July, 1892, says as to this latter class, that he has stood for hours in the Court of General Sessions in New York to study criminals. Fully 80 per cent. showed evidences of arrested brain development, brains pinched by poverty from father to son for one hundred years.

Fortunately, while the microscopical discoveries we have alluded to and the biological observation are probably correct, the deductions are far from being established facts.

One cannot but be struck by the subtlety of the disputations and the ingenious logic employed by rival savants in support of the various theories of heredity, nor can the rival student long be oblivious of the fact that there is far more of theory than established truth in them all.

Weismann holds the essential part of the primitive cell, the germ plasm, to be stable and unchangeable, transmitted for countless centuries unaffected by the body in which it dwells, ever since amphimixis developed the multicellular organism from the unicellular.

If by this we were to understand the transmission of the mere life principle of the race alone, we need not be disturbed, but he holds that congenital characters or individual peculiarities, whether mental or structural, are inevitably and invariably transmitted, while, contrary to the views of Darwin, Galton, and others, acquired characteristics, favorable or adverse, the result of environment or other agencies, cannot be transmitted.*

A brilliant and accomplished writer of this country, Prof. George J. Romanes, recently deceased, has controverted these theories in a masterly manner, † but as a supporter of the fundamental principles, if not of the full theories, of some of his predecessors, he also only brings into view the inexorable fate and the unbreakable chain, ‡ and we are staggered by the apprehension that man, from the moment of conception, is mercilessly and inextricably bound to a certain course, a fixed and preordained development.

Admitting, however, that the researches of Darwin, Galton, Nägeli, Lamarch, and the many other eminent men who have held or who hold such high position, have been wide, laborious, and thorough, their learning stupendous, and their theories fascinating, we are not yet obliged to accept either the doctrine of pangenesis and gemmules, nor of "germ-

* *Germ Plasm* (Aug. Weismann, 1893).

† *Weismannism to Date*.

‡ *Weismann* (Open Court Co., 1893).

plasm," nor of the many intermediate theories, for they are still theories.

Future and more subtle investigation may yet supplant them all.

As applicable to our problem, however, the subject of primary cell development from amphimixis will be later introduced.

There is an inheritance of age; there is one of special forms of disease, and there is one of fragile constitution, which easily succumbs to all diseases. These may be intercurrent or distinct.

With regard to that of age alone, while it is generally true that the expectancy of life is estimated as about two-thirds the difference between one's age and eighty years, we think it can be shown that the attainment of the age of seventy is possible to almost every man, and that even longevity of the parents is not essential.

The attainment of an age much in excess of seventy, however, occurs chiefly to those whose parents have done the same.

A FEW NEW OBSERVATIONS.

Having obtained the complete family records up to date of death of 251 men who died last year over seventy years of age, and of 104 who died between that age and twenty, the following interesting results appear:

	No.	Av. Age	Av. Age of Father	Av. Age of Mother	Joint Av.
Dead over 80.....	56	82.05	66.85	66.75	66.80
Dead over 70.....	251	75.74	66.02	64.37	65.19
Dead under 70 and over 20...	104	54.74	67.92	63.65	65.78

At first sight it would appear from this that it mattered little to a man whether one or both parents lived to seventy and above.

The joint average age of the parents of those who died *under* seventy even exceeds that of those who died over seventy, and approximates that of those who survived eighty.

That a comparatively large number of men whose average age at death was eighty-two years, should have sprung from parents whose average age was but sixty-seven, appears startling, and that a larger number whose average age at death was fifty-five years, should have come from parents averaging sixty-six years, suggests some error of figures.

This, however, is not the case. The figures have been carefully verified by a competent accountant.

A moment's reflection will show that the results simply indicate as far as they go the great law of average of human life.

Without having accurate calculation, I think it safe to place the average age of all fairly healthful parents at not far from sixty-six years.

The real significance of the results obtained lie in the following facts:

Seventy is not old age, nor is it essential to any man's prospects that his parents—one or both—should have reached that period.

To attain actual old age is another matter.

In those above tabulated, of the men dead over seventy, both parents survived seventy in 27 per cent.; of the men dead under seventy, both parents survived seventy in 24 per cent.; of those who died over eighty, both parents survived only in 23 per cent. In the first series the father only was over seventy in 20 per cent.; the mother only was over seventy in 22 per cent. In the second series the father only was over seventy in 21 per cent.; the mother only was over seventy in 24 per cent. But in the last series (over eighty), the father only was over seventy in 29 per cent.; the mother in 31 per cent.

Now here is a significant feature and, while it is not vital to our particular subject, it is interesting:

In those who died over eighty, one or both parents were over seventy in 84 per cent.; in those who died over seventy, one or both parents were seventy in 71 per cent.; in those who died under seventy, one or both parents were over seventy in 69.5 per cent.

The number of those over eighty (56) is comparatively small, but the figures are given for what they are worth.

The difficulty of getting reliable information as to parents of men averaging eighty-two years of age is very great, but I expect to quadruple the number in the future.

The probabilities favor the correctness of the result given.

INHERITANCE OF SPECIAL FORMS OF DISEASE.

Experience and observation alike show transmission of an occult tendency to special diseases in certain families through many generations, and these would appear to warrant a negative answer to our inquiry in such families.

Hæmophilia, or the liability to intractable and dangerous bleeding, passes from one generation to another, sometimes skipping one, and singularly favors the female line.

Most physicians have seen examples; those cited by Lossen and Chelius, where four consecutive generations were afflicted, are most frequently quoted.

Pityriasis versicolor, where, as in a case cited by Darwin, the males only suffered, and the father, grandfather, uncles, and seven cousins were affected, the disease disappearing at the age of forty.

Alopecia affects chiefly males at about the same age for several generations.

With reference to development of abnormalities at fixed ages, Darwin says he is convinced, from numberless experiments with plants, of the principle of developed inheritance at corresponding periods of age.

Blindness.—Le Compte observed a family in which this occurred through three generations, twenty-seven children and grandchildren, coming on between the fifteenth and sixteenth year, and ending in a total blindness at twenty-two.*

Darwin † cites a family where the father and four children were all blind at twenty-one, and another where the grandmother became blind at thirty-five, a daughter at nineteen, and three grandchildren at thirteen and eleven; one of deafness where two brothers, the father, and the paternal grandfather all became deaf at forty, and adds:

"I have recently seen a case in which a mother, a grand-

* Sedgwick, *Balt. Med. and Phys. Reg.*, 1809.

† *Animals and Plants under Domestication*, vol. ii., p. 54.

mother, a brother, and two sisters became deaf at twenty-two from no known cause." *

Insanity.—Esquirol says, as quoted by Bucknell and Tuke, that of all diseases insanity is the most likely to be inherited.

Asthma is not infrequent through several generations, beginning at the same age.

Criminality.—The literature of modern times has made us familiar with the claim that the debased criminal has a peculiar conformation of the skull; with the often quoted history of the Jukes family, collated by Dr. Dugdale, where crime and prostitution stamped many generations; and with the peculiarly deformed ear of hereditary insanity.

Inebriety.—This subject in its hereditary aspects has been so thoroughly and frequently discussed that we need only say that instances of apparent transmission are but too frequently observed.

Degenerative Diseases.—To this class belong atheroma of cerebral or coronary arteries (and the resulting apoplexy, paralysis, and cardiac disease) and disease of the kidneys occurring prior to the natural degeneration of age. A tendency to these, I feel assured from observation, may be transmitted through many generations.

As observed by Sir Jas. Paget, each generation develops one or the other forms at an earlier age than its predecessor. In a large number of cases tabulated by him, he claims that this was true in nine out of ten.

These families are usually healthful and vigorous up to middle life. Some attain a great longevity, but some of the most promising succumb shortly after reaching only a fair maturity, the most fatal epoch being between fifty and sixty.

Syphilis.—The effect of this disease upon offspring and the enfeeblement and misery entailed upon innocent descendants are but too familiar. Fortunately for the race, the mortality among infants is excessive. The survivors are liable to diseases of the degenerative class.

Scrofula and Tuberculosis.—Few physicians have not known of families in which for many generations marasmus,

* Appl. for Life Ins., M. B. L., July 23, '95.

rickets, kyphosis, glandular disease and ulcerations, tuberculous joints and tuberculous lungs have decimated or destroyed the ranks of the young and middle-aged.

But we are not endeavoring to establish a negative answer to our proposition.

We answer it "Yes," notwithstanding the above array of formidable statements, but must qualify it by adding, if the evil inheritance is not a continuous and far-reaching one through both parents, and if exceptions to brevity of life have occurred in his not too remote direct or collateral ancestry.

As only an infinitely small number are born with *all* the curses of vitiated ancestry, in both lines of descent, the qualification is not serious.

History gives innumerable examples of the progeny of families where close interbreeding among the enervated and licentious has almost extinguished the line, but where the infusion of purer blood has given it new life.

From the rape of the Sabines to the present day, when royal and noble families find the preservation of their power dependent upon the introduction of different blood, aversion to the union of debility with disease has been instinctive.

Moreover, we rarely find families of any size where atavism is unknown, and where the vigor and potentiality of a grandfather or a great-grandfather or mother are not occasionally redeveloped in a fortunate individual.

Instances of long life indeed occur in the most enervated and cachectic families, through this fortunate peculiarity of heredity.

CONSIDERATION OF ADVERSE FACTS STATED.

First, as to the biological facts relative to the germ cell:

It is not many years since we began our knowledge of the impregnated ovum, with its segmentation; now we know * that after the union of the germ nuclei there is transformation of the chromatic substances into a definite number of chromosomes equal for the two sexes, and that after cleavage and

* *Atlas of Fertility and Karyokinesis of the Ovum.* Wilson and Leaming, 1895.

maturation there occurs a reduction of the number of chromosomes to one-half.

So far as I am informed, it cannot be proven that the reduction is precisely equal for the two sexes.

Nature, in the preservation of the species, shows too much regard for the survival of the fittest to make this so, if the potentiality of the two germs were widely diverse.

The resultant cell is the result of two principles joined in one, and we know that the traits and characteristics of both progenitors are intermingled. Vitality and stability are always dominant, and it is but a rational inference that the repeated addition of prepotent qualities through generations would inevitably yield improved offspring, and this is demonstrated by experience.

The Spartans in recognition of this principle enforced it by custom and law to a degree which in this day would be considered grossly immoral.

We do, however, recognize the fact that the proper mating of individuals is a matter of grave importance, and while to the individual the improper mating of his progenitors has little bearing in his desire to defeat the baneful effects, yet it is of serious importance if he too is to assume the responsibility of paternity.

In the absence of governmental control (by no means unknown in history) match-making should be elevated to a science for the good of the race.

The marriage of two persons of similar tendency to degeneration should be a disgrace or a misdemeanor. The diseases we have cited as intractable die out in families only when marriage of persons of diverse temperaments is fostered, and even hæmophilia, which occurs chiefly among females, is eradicated by the union of the males with exceptionally healthful females of other stock.

The æsthetic element in man seems to bar his application to himself of what he acknowledges to be true of all other animals, as well as of birds, insects, and plants.

The perpetuation of desirable traits in animals is now regarded as a prime element in profitable breeding. Even

abnormalities have been perpetuated, as in the case of the famous Ancon breed of sheep, whose legs were too short to allow the jumping of fences.

A more interesting instance is that of the famous Charmoise breed of sheep. It was found impossible to profitably raise English sheep in France. Degeneration of the lambs occurred in the very first year. M. Malingre Novel adopted the expedient of crossing with intermediate types, and obtained a breed having the constitution of the English with the climatic qualities of the French.

THE GERM CELL AND ACQUIRED CHARACTERS.

The Weismann doctrine claims that only congenital and never acquired characteristics are transmitted.

This to me is incomprehensible, in spite of the plausible arguments advanced in its support, and for this reason:

We must believe that man was originally created without disease, although with susceptibility to it. The tendency observed to certain diseases in preference to others must then at some period in the life history of the race have been acquired. If germ plasm has been ever continuous and unchanged since the beginning of life, we are forced, as stated by Prof. Romanes, to the conclusion that congenital variations originated in the primitive unicellular organism. This is incredible.

The character of the backing of this, however, may be best indicated by quoting from an editorial in a recent New York medical journal,* as follows:

"There is a strong and growing tendency to regard many forms of morbid action as reversion to processes which were normal or physical in these tissues at an earlier stage of their ancestral development. For instance, calcareous degeneration is a 'dropping back' to the simpler and easier processes of the coral-polyp or chalk-animalcule (*Globigerina*) stage of our development, fibroid change a sinking on the part of the cells involved to the sponge-level, cancer a 'rebellion' of the glandular epithelium, involving a return to the anarchistic

* *News*, January, 1896.

'every-cell-for-himself' hydroid stage, gout a falling of the liver and muscle cells in the avian or reptilian stage, in which uric acid is their normal product, etc. According to this suggested theory, any prolonged lowering of the nutrition or vitality of a part of the entire system, whether from local causes, such as fibrotic arteries, or from general, such as underfeeding, excessive exposure, insufficient supply of oxygen, senile changes, etc., may be sufficient to set up one of these reversionary degenerations and thus account for a large class of disease."

ACQUIRED IMMUNITY.

Difference in degree of immunity from disease is as marked in races under diverse conditions as in animals.

That an increased immunity may be acquired by obedience to natural laws and adapted environment is indisputable.

That the blood may be rendered infertile to certain diseases, just as the soil, adapted to certain plants, may be made infertile to others, is but a matter of observation.

What has been acquired is foreign and not an essential part of the organism, and that it may be eradicated is but the deduction of every-day experience.

This cultivation of immunity is just now receiving deserved attention and study.

Starting in its practical form in the observations of Metchnikoff in the laboratory of Pasteur as the doctrine of phagocytosis, at first discredited and scoffed at, it has become an accepted fact, and much ingenious labor has been bestowed upon methods for increasing the number and vigor of these enemies of disease.

We cannot, of course, assert positively that this phagocytic process is the only one granting immunity, but it certainly contributes to it.

Messrs. Gley and Chavrin, in the *Archives of Physiology* for January, 1894 (Paris), claim to have demonstrated the hereditary transmission of immunity, and Büchner, in a recent Munich journal, claims that immunity is brought about by the presence in the blood of a substance called "Aléxin."

In the rough notes made for this article I find a series of cases from personal experience, giving remarkable instances of the development of immunity from the diseases prevalent in the family.

The time already given, however, to this part of our subject forbids their introduction. They confirm, at least, my own conviction that the development of immunity to ancestral disease is possible to any man.

DEFEAT OF BANEFUL INHERITANCE BY THE INDIVIDUAL.

Suppose an individual finds himself possessed of this piece of mechanism we call constitution, transmitted as the composite of contributions from his progenitors, and realizes that it is not like that of pine with oak, of carbon with iron, or of zinc with copper, giving a hardness belonging to neither alone. How is he to remedy and defeat his inheritance?

There seem to me to be three essentials: Early subjugation of the will, proper environment, and well-considered marriage.

EARLY SUBJUGATION OF THE WILL.

Few children born of licentious and depraved parents whose natural tendency to evil has been unchecked, or whose passions have been fostered rather than curbed, pass the period even of puberty without an enfeeblement of vitality. This however, is not, as would at first appear, the fault of inheritance, but the result of their own willingness to do evil.

There are many of such degenerate lineage, however, that, as stated by Maudsley,* "their defective natures will not take the stamp of virtue." They are born with either absence or bluntness of moral sense. Yet in many, perhaps most of these, there lies dormant the spark of good which may be quenched or by right education developed into flame.

The exhibition of right motives, contact with men of noble purpose and women of unselfish and holy lives, has moulded many a distorted character, and led it out into bodily as well as mental and moral health.

**Body and Will.*

It is, however, chiefly with the subjugation of the will by the voluntary act of the individual that we have now to do.

A young man whose parents were inebriates puts on his own chains when he allows his associations to be those of the saloon or street, or fails to curb the tendency which he well knows will be strengthened by every yielding.

The maddening craving for alcohol will never come to him who has resisted the desire to taste it and has never felt the first thrill that wine gives to the sensitive brain, but there are those, and alas they are many, to whom one single glass taken innocently for exhaustion or disease has proven the torch to start a final conflagration.

A young man is insensibly educated toward or away from his special tendency by those with whom he puts himself in daily contact, and who are largely at the outset the outcome of his own voluntary choice.

This choice is usually the combined result of his home influence and his own defects. It is a lamentable fact that man likes to associate with those who are weak in the same direction as himself, and with foolish egotism likes to toy with and examine the evils which he knows are to him especially hazardous. If he chooses that which shows the consequences of evil, that fills his mind with high aspirations and noble purposes to the exclusion of evil, he chooses a potent factor in shaping his life. To deny this is to claim that to some men free will has been denied.

No sane man whose ancestors had developed insanity would take a position as wardmaster in a lunatic asylum.

No wise man with a history of parental inebriety would become a bartender, nor would a prudent man whose ancestors were asthmatic or gouty deliberately indulge in the excesses of wine and high living. Yet, unfortunately, such men are led along, educated by their associations to wilful yielding, or through their own voluntary indecisions find themselves defying the tendencies of which they are possessed.

Most men shrink at first from the brink of a precipice, but later pride themselves on walking upon the outermost edge.

Subjugation of the will includes, of course, domination

over the appetites as well as the passions, but among these, as influencing the endurance of physical vitality, perversion of the common appetite for food and drink is not the least.

Of the passions and their influence upon the period of puberty and adult life it is unnecessary to speak, as the subject is too familiar; but of the lust for excitement, whether of late hours and new shows, or of artificial foods and for stimulating excitants to a blasé stomach, the foundation may be laid in children by thoughtless parents, but is made lasting only by the individual.

In a considerable experience in family practice, I long ago noticed that the families most frequently requiring attendance were not those where actual disease prevailed, but where the children indulged in indigestible knickknacks *ad libitum*.

This did not occur alone among the rich. To the comparatively poor, lobsters, cocoanut pies, and ice-cream, not infrequently mixed, were luxuries that took the place of proper food.

As a result of all this folly, by no means of isolated infrequency, I have seen querulous, weakly adolescence, enfeebled manhood or womanhood, and the development of the family disease.

For the period of childhood the exercise of free will is impossible, but there comes a time before the damage is irretrievable when experience warns that a change is possible, and when the will to do or undo rests with the individual, and when the general dissemination of knowledge of the laws of health makes the right path plain.

It may at first seem a simple matter, but the persistence of habits that violate the first principles of Nature's laws weakens irremediably the foundations essential to maturity.

What appear simple violations of these laws often explain unlooked-for results.

Alopecia in families will usually be found due to neglect of a pityriasis of the scalp; itself a result of the persistent and unnecessary constriction of the head by a tight hat.

In the few instances of hereditary blindness coming under

my own observation, the inheritance seemed clearly that of a wilful and determined overstrain of the eyes in a poor light in spite of warnings and even entreaties.

I have seen numberless instances in strumous or otherwise degenerate families, where abstinence, self-control, regular habits, and well-regulated exercise have defeated the family tendency for many years; this, also, in families of neurotic tendency, including, of course, asthma and allied neuroses.

Condition adequate to emergencies is the keynote to our harp of a thousand strings.

The maintenance by one's self of a sound mind in a sound body, the conservation of vital forces, *is this condition* par excellence. It is essential to daily regeneration and rejuvenation.

On a table in my library are carved two fabulous creatures with wings and claws and long necks engaged in mortal combat. Each monster has grasped the other's neck in its powerful jaws.

If these had been living creatures, victory might at first seem to be assured for the one with the greatest vitality, who could longest resist strangulation, whereas, in truth, it would probably fall to the one in the best present condition, whose grasp would be the fiercest and whose sharp teeth might crush the spinal vertebræ.

In conflict with our ever-present enemy, disease, *condition* often decides the issue, even though condition plus inherited vitality is more potent.

ENVIRONMENT.

What has already been said has involved so much of the influence of environment that this may be but briefly considered.

One cannot raise many rose-bushes in a sunless alley among tomato- and ash-cans and kitchen refuse.

Even the young oak will languish and die if environed by circumstances and conditions unfavorable to its nutrition.

The strumous child that passes his adolescence in a close office or on the saddler's or shoemaker's or tailor's bench makes but poor material out of which to build a lasting constitution.

The young man of neurotic tendencies with insanity or suicide in his family overstrings his sensitive nerves in the rush and worry of Wall Street and courts his family disease.

The atmosphere of the stock-room or the worry and excitement of the speculator's life are ill suited to perpetuate soundness of heart, brain, or kidneys in the man whose family has been marked by early degenerative disease.

The weakling of the human race should certainly avoid the condition of trade or residence under which his parents succumbed.

Some years ago I was financially interested in a business in which many steel-grinders were employed.

A large proportion of these came from Sheffield, England, where their fathers and grandfathers worked at the stone and died of consumption.

Weak and puny children had followed suit.

Some of these men could not abandon the trade of their families, and working in close, wet quarters frequently died from pulmonary disease.

As a rule they were far from vigorous, and the children showed clearly their inheritance.

Many, however, after a short trial in this country, took up other branches of business.

The change in these men was so often a subject of comment as to cause a considerable and steady secession from the grinding department.

A few years ago the Labor Bureau of New Jersey began an enquiry into the trade life of workmen and endeavored to ascertain the age at which they began to decline.

This work was never pushed to the extent of establishing its full value, but the following are some of the rather unexpected results.

**INVESTIGATION INTO THE INFLUENCE OF TRADES UPON THE HEALTH
OF 13,000 TRADESMEN.**

Number under Observation.	Trade.	Age When Be- ginning to De- cline.	Predominating Cause.
1257	Hat finishers.	32	
22	Potters (mould).	33	
661	Plumbers.	34	Fever and lung diseases.
1445	Brakemen.	35	Accidents.
99	Jiggermen (potteries).	35	
411	Locomotive firemen.	35	Accidents and diseases of
3	Throwers (potteries).	36	kidneys.
462	Printers.	36	
1235	Painters.	37	Painters' colic.
455	Pressers (potteries).	38	
126	Flint-glass bottle.	38	
30	Dippers (potteries).	38	
514	Green-bottle makers.	38	
31	Handlers (potteries).	39	
1247	Hat makers.	39	
26	Sagger makers (potteries).	39	
1061	Cigar makers.	41	Throat and lung diseases.
297	Kilnmen (potteries).	41	
1022	Bricklayers and masons.	42	Rheumatism.
15	Potmakers (glass).	43	
112	Switchmen.	43	Accidents.
368	R. R. Conductors.	44	Rheumatism.
1269	Miners (iron).	44	
2735	Carpenters.	44	
73	Hat pouncers.	45	
57	Glass shearers.	46	
933	Bakers.	47	General debility.
39	Flint glass (regulators).	47	
449	Locomotive engineers.	47	Diseases of kidneys.
149	Window-glass makers.	50	
76	" " cutters.	52	
39	" " flatteners.	53	

Collated from Reports of N. J. Bureau of Labor, 1892-95.

Complete and thorough investigation in this direction would furnish a guide by which deleterious occupations could be avoided.

The report in one place says: "House painters suffer from injuries from defective scaffolding as well as from lead poison. Most of these tradesmen are laid off by disease after ten or twelve years' work. It is rare to meet an old painter without evidence of disease.

"Plumbers are rarely able to work at the trade thirty years. They become rheumatic or otherwise unfit. In England the death-rate among painters over thirty-five years of age is twice that of agriculturists, and this is probably true in this country."

Misfortune is not always to be regretted for men of impaired inheritance.

A moderate deprivation of the means for rapid combustion of the vital forces (for this is what it amounts to) may enable the son to defeat the tendency born of affluence for generations.

Few physicians have not seen instances of placid, comfortable old age in men whose fathers and grandfathers had wine and dined and raced, and died from the natural result of overtaxed kidneys, degenerate heart, or atheromatous arteries.

MARRIAGE.

It may seem singular to cite the marriage of an individual as a potent factor in his defeat of unfortunate heredity, but man is peculiarly gregarious; what he feels and thinks and especially what he becomes, very largely depend on the pressure exerted on him day after day by those in most intimate contact.

It is not assumed that marriage is essential.

There are men who conserve their energies by remaining single or defeat a baneful inheritance by celibacy.

What I would maintain is, that men of such heredity, who marry (as most men do), assume a tremendous bias, either for or against their ancestral tendencies.

The observation might be made axiomatic, that a marriage where a healthful and congenial companion shares or bears the anxieties and wearisome burdens of life, favors, nay, makes the condition necessary to withstand disease.

Reflection will show that this may be true, even of hæmophilia, and it is undeniably true of insanity, inebriety, tuberculosis, and degenerative diseases.

The young man of consumptive family who marries into

a similar family doubles his own chances of consumption, for if either he or the wife fall ill with it, the other adds the wear of watching and anxiety to the recognized danger of infection.

If he marries into a robust line, it is the other party and not himself to whom the risk is increased.

I have often noticed a singular thing in this connection, viz.: that of men of feeble vitality and consumptive lineage developing the disease after marriage, losing the wife from the disease and themselves recovering, and this in some cases for two and three successive marriages.

A considerable number of these cases may be found published in the *American Journal of the Medical Sciences* for July, 1878, under the title "Is Consumption Contagious?"

The sensitive man of neurotic and perhaps insane lineage, who finds the angel of the bridal day developing into a vixen or a shrew, is brought to face the grim fate of his ancestors as surely—if not as soon—as if the lineage of his wife were tainted like his own.

The man of iron ancestry may coolly brave year after year the nagging of a querulous and unreasonable woman, while the husband with an inebriate tendency actually hails his fate sooner or later in the nepenthe of intemperance.

Many an extravagant wife has dragged out the skeleton of her husband's family in the shape of latent criminality, or drawn him to the gambling table, to riotous dissipation, and an early ending of it all by apoplexy or Bright's disease. We surely need not prolong the catalogue of ills from unfortunate marriage.

To most men adaptation to circumstances is possible, but to the man who would defeat a baneful inheritance this may be impossible, and marriage to him is of vital importance.

May we not then hold it to be true,

1st.—That while by the laws of life all men will not arrive at seventy, the allotted threescore years and ten, the chances for each are not so unequal as at first appears.

2d.—That subjugation of the will, environment, and marriage are potent factors in defeating a baneful inheritance.

APPLICATION.

We have discussed the question wherein man *can* defeat his inheritance, not whether he does do this.

As regards life insurance, the vital question is whether men do it to such an extent as to make a difference in our selection of lives.

We all know that men have reached advanced life whose families have been almost annihilated by some one form of disease.

There must be some adequate explanation of this.

I have already practically expressed my belief that both, or either of the following factors are adequate, to wit: Reversionary inheritance from some robust ancestor, or a potentiality of life resulting from volitional cultivation and environment.

We can often see the relation of things best by taking extremes for comparison.

Take, for example, a man at forty years of age, with a decidedly tuberculous or otherwise degenerate family; the party of good habits, of congenial and healthful occupation, happily married and living in a healthful locality. Compare with him one of same age, with a similar family record, a printer or painter by trade, a liberal user of beer, with a neglected home in a tenement district, a vixenish wife, and quarrelsome children.

The difference in chance of continued life in these two men is at once apparent.

Both, however, are barred in most life-insurance companies.

This appears an injustice to the former, and to some extent it is so. Such men may be safely insured for a reasonable term of years.

An insurmountable objection, however, to placing them on the same basis as those of healthful condition, plus a healthful ancestry, lies in this. Prosperity is evanescent. In a few years the two men compared may have changed places, and the latent tendency to disease be developed.

This tendency of evil may be likened to concealed tinder, harmless so long as the spark is wanting.

Of a thousand cases like the favorable one cited, it is indisputable that many will defeat their inheritance, but so long as the uncertainties of fortune and domestic happiness and of environment continue as they are and will be to the end of time, a majority will not do so, and consequently such risks on life plan at table rates would not prove desirable. They might be, however, for limited periods.

We are often accused of giving too much weight to family records and too little to personal history and condition.

For applicants for life policies I do not believe we err in this direction, but I do believe that personal record and condition may possibly outweigh a bad family record for policies to terminate between fifty and sixty years of age.

At the conclusion of this excellent paper, which was much appreciated, the thanks of the Association were extended to Dr. Holden. At 1.30 P.M. the meeting adjourned for one hour.

At 2.30 P.M. the meeting was again called to order by the President when, on motion, the subject, "Syphilis in its Relations to Life Insurance," was taken up, each member being limited to three minutes. Each member gave his views and the custom of his company in the treatment of syphilitics, citing cases in illustration. The greatest interest was manifested in the discussion.

On motion, the thanks of the Association were extended to the Life Insurance Company of Virginia and to the Life Underwriters' Association of Virginia, for their hospitality.

On motion, the meeting then adjourned.

At 9 P.M. May 1st, 1896, the members and their guests sat down to an excellent dinner provided by

the Hotel Jefferson; after which some remarks were made by Dr. Tabb welcoming the Association to Richmond, and by Dr. Webb, Dr. McCaw of Richmond, Dr. Frank Wells, Dr. Ross, Dr. Lambert; Dr. McGuire, on behalf of his father, Dr. Hunter McGuire, who was unable to be present; Dr. Huntington, Dr. Hamill; Dr. Lee, in response to the toast to the Lees of Virginia; Dr. Grant, Drs. Welford and Upsher of Richmond, Dr. Devendorf, Dr. Campbell, Dr. Davis, Dr. Morgan, Dr. Root, Dr. Wood, Dr. Fisher, Dr. Wilkins, Dr. Hoge, and Dr. Brannan.

On motion, the Association expressed thanks to the proprietors of the Hotel Jefferson for their handsome entertainment.

The meeting then adjourned.

EIGHTH ANNUAL MEETING.

The Eighth Annual Meeting of the Association was held at the office of the New York Life Insurance Company, No. 346 Broadway, New York City, on May 20th and 21st, 1897, Dr. Edgar Holden in the Chair. The following members were present: Drs. Brannan, Burrage, Chapin (Home Life), Curtis, Davis (G. P.), Davis (John L.), Devendorf, Emery, Fisher, Grant, Hamill, Holden, Homans 2d, Huntington, King, Kucher, Lambert, Morgan, Munn, Northcott, Rogers, Russell, Scott, Shepherd, Storrs, Tabb, Thorburn, Toulmin, Vandewater, Van Wagenen, Webb, Wells (Frank), Wells (George W.), White, Wilkins, Winston, and Young,—37 members.

The minutes of the last annual meeting and of the meetings of the Executive Committee were read and accepted. Dr. Holden then formally opened with an address on "Selection after Middle Life." Certain questions were raised by this address to be considered in the discussion to be held on the following day.

Dr. Huntington, on behalf of the New York Life Insurance Co., welcomed the members to its new building and extended an invitation to a luncheon at 1 o'clock that day.

Dr. Addison S. Thayer of the Union Mutual Life Insurance Co. and Dr. W. R. Cluness of the Pacific Mutual Life Insurance Co. were unanimously elected to membership.

The death of Dr. Thomas A. Foster of the Union Mutual Life, of Dr. Lewis McKnight of the North-

western Mutual Life, and of Dr. Charles Bernacki of the Germania Life having been announced, committees were appointed by the President to draft resolutions expressing the sentiments of the Association as follows: Dr. Northcott on the death of Dr. Foster, Dr. Kucher on the death of Dr. Bernacki, and Dr. Fisher on the death of Dr. McKnight.

Upon motion, the Association adjourned until
2 P.M.

The afternoon session was called to order at 2.15 P.M.

Upon motion, the recommendation of the Executive Committee, that the minutes be adopted at the close of the meeting and the Secretary have the same printed and distributed as soon thereafter as possible, was adopted.

An Amendment to the Constitution, laid over from the last meeting, was then submitted for consideration as follows:

"That when from any cause a member ceases to be a Medical Director of a Life Insurance Company, his membership in the Association shall lapse by that circumstance."

On motion, duly seconded, it was adopted.

The Committee on the Standard Table of Heights and Weights with chest and abdominal girth in their relation to age, Dr. Shepherd, Chairman, then submitted its report. Upon motion, duly seconded, the report was accepted and the thanks of the Association were extended to Dr. Shepherd.

On motion of Dr. Tabb, Dr. Landon Carter Gray was elected an Honorary Member of the Association. On motion of Dr. G. W. Wells, Dr. S. Glover Lyon

of London was elected an Honorary Member of the Association.

The election of officers was then proceeded with as follows: an informal ballot was taken for each of the offices, the highest three names on the poll being balloted for. The result was as follows:

PRESIDENT.

DR. TABB.

1ST VICE-PRESIDENT.

DR. SHEPHERD.

2D VICE-PRESIDENT.

DR. WEBB.

SECRETARY.

DR. ROGERS.

TREASURER.

DR. BRANNAN.

EXECUTIVE COMMITTEE.

DR. CURTIS.

DR. HUNTINGTON.

DR. WOOD.

DR. WHITE.

The meeting then adjourned until the following day at 10.30.

SECOND DAY.

Meeting called to order at 10.30.

Resolutions were submitted by Dr. Kucher, of the Germania Life Insurance Company, on the death of Dr. Charles Bernacki as follows:

"Whereas, The Association has learned with profound

regret of the death at Schaudau, Germany, on the 17th day of September last, of Dr. Charles Bernacki, who since April, 1864, has been medical director of the Germania Life Insurance Company, and who was one of the founders of the Association, it is hereby

"Resolved, That by the death of Dr. Bernacki the Association has lost one of its most esteemed and valuable members, who by his nobility of character, charm of manner, and kindly disposition has endeared himself to all his associates;

"Resolved, That we hereby express our admiration of the eminent professional ability displayed by Dr. Bernacki during his long connection with the Germania Life, the Association of Medical Directors, and his long career as a physician;

"Resolved, That we hereby tender to his afflicted family our sympathy and condolence in the great bereavement that has befallen them."

Upon motion these were adopted.

Dr. Fisher submitted the following resolutions on the death of Dr. McKnight:

"It is with deep regret that this Association is called upon to record the death of one of its charter members, Dr. Lewis McKnight, who died August 21st, 1896, in his seventy-ninth year, who became the Medical Director of the Northwestern Mutual Life Insurance Company at its organization in the year 1858, and served as such up to the time of his death. All who knew him appreciated his worth: a man of character and ability and an honor to his profession.

"Be it therefore resolved, That the members of this Association tender their sympathy to his bereaved family and to the Company that he so long and faithfully and honorably served."

Upon motion these were adopted.

Dr. Northcott made some feeling remarks on his long acquaintance with Dr. Foster and offered

the following resolutions, which upon motion were adopted:

"Whereas, We have been bereaved in the death of our late associate, Thomas A. Foster, M.D.;

"Be it resolved, That we tender to his family our sincere sympathy in this dispensation of Divine Providence, and beg to assure them of the great esteem and consideration in which he was held by members of the Association."

A paper was read by Dr. Russell on

THE SELECTION OF LIVES FOR INSURANCE.

When Dr. Huntington desired that I should prepare a paper for this meeting of the Association, I unwillingly, and, as appears to me now, foolishly, consented conditionally, thinking that some reminiscences and suggestions concerning the part which we take in life insurance might be as entertaining, if not as profitable, as a more elaborate essay. And then he cunningly suggested that my long experience as medical director would doubtless afford enough subjects for consideration.

Now, you may have observed that if there is anything which an old man prides in himself, and values highly, it is his "experience." If he listens to elaborate reasoning, and lengthy tables of statistics, he does so with a quiet politeness which comes not from conviction, if they do not correspond with his "experience," and I suppose that this is about the way in which an old practitioner regards many of the cases in which he is called in consultation. How many times have I seen this little drama played out, and perhaps been a participator in it myself! So that, when his opinion has been asked, he quietly commences by saying that "my experience" has been so and so, and I have found that such and such remedies have always produced the best results, and very likely ends the matter by relating a case which occurred many years previously. The minuteness with which this is detailed may excite in you astonishment, if it does not

fully convince you of its accuracy. So I must pray your pardon if no abstruse or logical reasoning, or reference to authors, or numerous tables of statistics, should be presented to you.

Not unfrequently authors write without much knowledge or experience, or tell us only what we knew before, but write for the purpose of gaining a reputation and bringing themselves before the public. When we consider the great number of volumes which are annually presented to us we may wonder that so much is considered necessary to make us proficient in our art.

Far be it from me to speak slightly of any efforts to acquire knowledge from others, but it is a duty which one owes to himself to think for himself, and, being qualified by study and close observation and such natural gifts as have been given him, while respecting the opinions of others, to have also a respect for his own. Possibly they are worth as much as the so-called "truths," or flippant opinions of a ready writer. Possibly, also, they may be the result of a more severe study and more extensive observation. I yield to no one in my admiration and wonder at the great improvements which have been made of late years in medicine, in surgery, and in hygiene, and view with satisfaction the more reasonable, correct, and conservative opinions which govern us now as medical directors.

Please remember, and it is desired to be distinctly understood, that in writing the above I do not claim for myself any wonderful power of judgment or discrimination, beyond any of you; nor do I desire that any opinions which may be stated should receive your approval, unless they appear to be reasonable. Free discussion of all matters which come before us should be allowed, and perfect respect for the opinions of one another should be conceded. The jealousies and differences of the numerous life insurance companies should have no part in that specialty which immediately concerns us.

It was in the summer of 1850 that I entered the service of the *Ætna* Life Insurance Company, as medical examiner, and

have held that position to the present time. Dr. Grant was associated with me for four or five years, when he retired. Dr. Campbell has been assistant medical director for the last three years. When I have been ill, or absent from town, neither of which causes have kept me long from the office, it has been necessary to call upon some of my medical brethren, who have faithfully cared for the duties. So that in by far the greater portion of these forty-seven years, nearly all applications have come before me. It is not necessary to inquire, nor do I wish to know, if any among you have served a longer time than this. Certainly some of you have considered a larger number of applications than has fallen to my lot, and without doubt have considered them all with equal skill, and a desire to do justice to both the company and the applicant.

Without going into the history of life insurance in this country, it is sufficient to say that the early requirements for insurance were brief and pitiful. The personal examination was not thorough or minute; the fact that a man wished to be insured was almost *prima facie* evidence that he ought to be insured, and he was insured. Such careless business methods were enough to bring ruin upon many companies, as it did, and the wonder is that so many survived. Nothing but a more careful consideration of applicants, and a more thorough inquisition as to habits, occupation, family history, and physical conditions saved them from destruction. Gradually all these requirements have been increased; gradually, also, the importance of our position has been recognized. If we could only know all the facts in the history of applicants and all that pertains to their families, then we could more accurately, and justly also, quickly make our decisions. Without doubt the great majority of cases are sufficiently truthful, but the ways of some are very devious, in lightly passing over or wholly ignoring certain points which would be brought out with great force if the applicant was about to be drafted into the military service.

And now something may be said about the "justice" which is due to applicants, and of the "injustice" of which

agents complain to us. This whole matter, please remember, is purely a business one, which should govern both parties. The great interests involved are of importance to all, to the companies which insure, and to those desiring insurance. The companies desire to be prosperous and successful, and the insured wish to be certain of the payment of their policies, and this bears alike upon mutual and stock insurance. It finds its analogue also in other corporations dealing with individuals, which are careful of their interests and prudent in their management. No bank of discount will loan its funds except upon well-approved security, or what is supposed to be so. If it loses sight of honest business principles it is pretty sure to end in bankruptcy. It, therefore, feels obliged to inquire into the character and responsibility of its borrowers, and does so through various sources of information. The manufacturer, the merchant, the individual lender, does the same. It is a perfectly legitimate proceeding between the parties in interest, and should be equally respected by both. There is no injustice in this, and neither party has any right to complain. The judgment or conclusion of the medical director may sometimes be incorrect, and the applicant may feel himself aggrieved, but this is one of the chances attending any business agreement, and is not peculiar to life insurance alone. What bank or merchant would refuse to give credit to a man of unquestioned soundness? What bank or merchant conducting business with a view to success would loan money or sell goods to one without credit or responsibility? The financial end would be sure and certain. There should be no inducement existing on either side, except that of honest dealing with each other. The fact that dishonest dealings do occur, and that, too, frequently, only strengthens the force of the argument, and illustrates the want of due oversight, and the sad results which inevitably follow.

This line of reasoning well applies to the business of life insurance. Certainly it is not the desire of any company to refuse a risk which is good in all respects; on the contrary, it greatly desires to secure lives which are healthy, and which

promise to be healthy up to a certain period, and most assuredly we are obliged to pay roundly for them. Why, then, should we not desire to deal justly with all applicants? Self-interest alone should be the answer. If, before the bargain is completed, certain findings are discovered which make it undesirable, then it is a self-evident right which one of the parties exercises, not to complete the contract, and it comes to an end. The insurance company only does that which any safe corporation or sound business man does to render himself exempt from harm.

The application of all this comes with especial force and directness upon the medical director. He is supposed to understand his duty in determining the value of applications, and for this purpose he has been selected. He is placed, as it were, in a judicial position, and it becomes him to exercise his duty with a judicial mind. He is to examine all the evidence in the case; he is to consider not only the present health of the applicant, but the record of his family also; he will give more or less weight to the opinion of the local examiner who recommends him, and who is supposed to be intelligent and reliable. But the local examiner regards the case from a different standpoint from the examiner at the home office, who possibly may understand better the dangers which accompany the risk than the one who has made the personal recommendation. Admitting that the applicant is personally healthy does not always assure an acceptance. There are so many factors to be considered, not always duly thought of by the local examiner, and sometimes not duly regarded by him, that the final decision must be left to the medical director. This is a part of his work; it is expected of him, and, however disagreeable, he must take the responsibility. It is here that the judicial mind is particularly necessary. The home officer may make a mistake, his judgment may be at fault, and the rejected applicant may say that he will "outlive all the officers of the corporation"; but the chances are that he will not, and the "probabilities" must be settled by the director.

If in these cases complaints are made by agents it is

our duty to give them a respectful consideration. Sometimes, upon further evidence, we may be induced to change our opinion, not always, I fear, to the benefit of the company and occasionally to our own chagrin. When in general practice I learned that my first impressions of a disease were usually the most correct, the most to be relied upon both as to diagnosis and treatment. The first impression gained from an application where all the factors are plainly and accurately stated is usually the most trustworthy.

So, however valuable the recommendation may be, it is after all but a subjective opinion and, like some public documents, needs an official stamp to make it effective. It requires considerable courage and independence to report an unfavorable opinion upon an applicant, unless the facts are very evidently against him. I cannot withhold my admiration of the man who, seeking justice alone, speaketh the truth from his heart and places the final responsibility where it belongs. If, in any of these cases, one shirks his responsibility or gives his opinion with a mental reservation, he neither justly earns the money which is paid him nor establishes his character as an honorable physician. The medical director may make mistakes himself; human judgments are not infallible; our ablest jurists have been divided in opinion; even Jove himself will sometimes nod.

Instead of a fully detailed application, there is sometimes presented to us a statement by the agent, asking if such an one will be approved, if he passes the usual examination favorably, and says further that this is done for the purpose of avoiding an unnecessary expense. This course has been approved by some companies, and where such suggestions have been given we cannot complain of the agent; his desire to avoid expense is laudable. If the statement is favorable, he is instructed to have his candidate examined, and soon the whole matter is presented for our consideration. But here comes in the trouble. Perhaps he is not found to be in good health; perhaps—and this is most likely to happen—the statement of the agent and the written statement of the applicant do not correspond. Without a suspicion of wrong

intent on the part of the former, certain points which he did not mention at first, which he thought to be of no consequence, were omitted in his haste, or, which is more likely, were not stated to him by the latter, were more minutely detailed when the application was written out in full. Any medical director will hesitate to give his approval of such a case in advance, but the very fact that encouragement is given for its presentation is supposed to be sufficient for its approval, and astonishment is expressed if it is denied. Notwithstanding that it was explicitly stated that no promise was made when the examination was directed, and that no conclusion could be arrived at until all the papers were before me, I have nearly always found a disappointed agent if the application was refused. The fault lies especially in the rule, and its understanding by both parties; the applicant fears a rejection, which he hopes to avoid by this roundabout procedure, and the agent wishes to avoid the expense of a medical examination, which is really but a small portion of the cost of the whole matter. No court of justice would permit such a partial case to be presented for adjudication, and as to the plea that the expense of the examiner's fee was to be spared to the company, it seems as if the practice was, comparatively speaking, like saving at the spigot while wasting at the bung.

I am not disposed to criticise too sharply our agents, and without doubt this is true of you all. Generally they are honest and reliable, and can be trusted by us. If they cannot, then it is the business of the company to deal with them. If we take care of our end of the ship the captain will take care of the whole. When we have faithfully done our part of the work our special responsibility ceases, and if it is not satisfactory then we can leave it for others. I know that it has been the opinion of some that the dictum of the medical officer should be supreme and always binding. Probably this is almost universally true, but a case may arise where the evidence is so evenly balanced that a decision might be difficult, and you might as well draw straws to decide it. My opinion has been that a doubtful case had best be left to some other company more ambitious and enterprising. It is the

taking of "chances," when the "chances" are not enough on our side, which has ruined too many corporations as well as individuals.

Without doubt such minute discriminations may sometimes seem to our officers to be carrying the matter too far, for few non-professional men can fully understand the force of our objections, saying that the judgment is too precise or pragmatism, and they would like to issue the policy. Possibly the officers have some knowledge that we have not. I think there has lately been a discussion in some journals upon this very subject, and that the matter is not fully settled. It is not wise to make any fuss about it, for the responsibility is not with us, and we had better let it rest. Probably no one has less reason to complain than myself, and that through a long course of years and in association with many different men.

This judgment of us, or value of our opinions by non-professional people, is provoking, but is sure to come to every physician in the course of his life, however competent or judicious he may be; though supposed to be omnipotent, yet he will be criticised every day.

He does not escape this when he becomes the medical director in a life insurance company. In his early duties he is either without any positive opinions of his own, and is the victim of the last one who has him in hand, or is positive to the point of obstinacy. He may learn finally to become firm without being offensive. A want of harmony in any insurance office is sure to bring in dangers which ought to be avoided.

But the trouble lies more outside of the office, and perhaps most upon the solicitors themselves. I recognize fully their position, and how much they may be disappointed, when for days, and perhaps for weeks, they have labored to secure an applicant. If they ever had any doubts of success it was before the application was written, and their final conclusion is that they "never secured a better subject." This is confirmed by the examiner, who comforts them by saying that he "never examined a better man."

Sometimes the applicant feels himself aggrieved, and writes to the home office that "justice has not been done" him, and if he were seen by the medical director he would regard him favorably at once. Occasionally he presents himself in person, as if he could thus convict you of your mistake. If the various factors which go to make up a decision are unfavorable, and are not overcome by the one representing the possession of health, then the journey is taken in vain, and, however unwillingly, the application must be declined.

I am firmly convinced that all which we understand by "family history" is of the utmost importance. The natural vitality of some persons is well recognized, and if this factor is to be found in several generations of such persons, we have a reasonable guarantee for a long life. From accidents, special occupations, excesses of various kinds, an unusual attention to business, or continuous idleness, or downright laziness, some few may fall by the way, but the majority will reach their expected longevity, and possibly live beyond it. The very vigor which they possess not only lessens the danger of acute attacks, but enables them to recover more quickly, and thus shuts off much of the probability of chronic disease. Certainly the danger of organic affections is reduced when the period of convalescence is shortened, and the body soon returns to its condition of normal health.

I do not wish to argue at length that consumption, apoplexy or paralysis, rheumatism and gout, cancer, Bright's disease, or some other diseases are hereditary or are not. We are told by some that they are not, but there is certainly a disposition to these diseases more apparent in some families than in others. Their organization is such, perhaps their natural vitality is so low, that one or other of the above-named diseases is developed in some one or more of the family; perhaps he is unable to resist the specific bacillus which takes him for his host and finds here his chance for a victim, while his work has been extremely discouraging in a perfectly healthy and vigorous subject.

When the applicant speaks of consumption he makes use of the common and popular term, meaning some chronic

form of a disease of the lungs, attended with cough, expectoration, perhaps pain, hemorrhage, wasting, debility, and death. It is not always safe to say that this is due to tuberculosis alone, for all these conditions may exist from simple inflammatory actions.

I recognize fully, however, that that form of consumption which specifically is applied to an inflammation (bronchitis) primarily affecting the mucous lining of the bronchi and terminal air vesicles, is a severe and lasting disease; and it does last for a long term of years, not unfrequently, and I am persuaded also that this disposition to take on this diseased action is more apparent, not in certain individuals alone, but in the individuals of certain families. Let any one who has been long in general practice refresh his memory with what he has seen in his course of years, and he will find confirmation of this truth. Here is where the general practitioner possesses an advantage as medical director over the one who comes fresh from his schools and his books. Fortunately, however, these chronic bronchial cases often endure for a long while, and enable some sufferers to pass the ordinary period of longevity. While this disease is well worthy of our consideration it is as nothing when compared with tuberculosis, which afflicts other organs besides the lungs, and is responsible for the death of a large part of mankind.

Speaking in general terms, some form of disease of the heart may be added to this dangerous class. It may not be proper to say that this is due to heredity, but it is certain that a degenerative tendency is more apparent in some families than in others, and manifests itself in succeeding paralysis or apoplexies. Nor is this confined to persons of great weight loaded with a superabundance of fat, but is found also in those who are spare and of light weight. The blood-vessels are weakened from some cause, probably from sclerotic degeneration of their walls; the muscles of the heart are softened, and thus weakened, often without valvular disease, and thus comes dilatation, and, after a while, sudden death. This makes no account of diseased valves, from previous attacks of rheumatism, which add to the gravity of the case.

I venture to speak for a serious consideration of these statements, for I think they will enable us to avoid insurance in some instances, which otherwise might appear favorable.

Notwithstanding the assertion that an applicant is good for a large sum if he is good for a small one, this opinion is to be taken with some grains of allowance, and this is especially true when the company is not of the greatest size. If the number of such acceptances is small they manifestly form an insufficient basis of average and expose the company to a large fluctuation in its average amount of annual death claims. And with these large sums there is a certain amount of what is called "moral hazard," which may only consist of a vague suspicion and therefore ought not to be recognized, but it is a suspicion from which we cannot easily divest ourselves. Particularly is this true when the applicant has been ardent in business, in pleasure, or in love. I think it is more especially true when he has passed the fiftieth year of his age. Between this period and the ten succeeding years he will have a time of trial, which will show whether his natural vitality has been overstrained. It is not sufficient to say that he is now wealthy and that the sum proposed is not for him proportionately greater than for one with much smaller means. If he is moderately insured why should he desire to add more to his estate, and at this late time of his life? It is large enough already for his actual needs and those of his heirs, and the investment then becomes one of a speculative character, which is foreign to the beneficent business of a well-managed life insurance company; it is somewhat like an over-insurance upon goods from loss or damage by fire.

In all such cases submitted to you for approval there can be no doubt that a most searching examination should be made. There may be no evidence in the papers to show anything but a perfect state of health. He may never, or rarely have required the service of a physician, and personally seems to be in perfect health. To be sure, he is a little troubled in his breathing as he ascends the stairs, and he does not walk much, for he can afford to ride; his life is rounded with ease and comfort; he gratifies his appetite in eating or drinking.

and he declares he is moderate in both; he denies positively that he uses alcoholic stimulants to excess, but is fond of his dinner, which he says is his best meal; he also sleeps the sleep of the just. How can we refuse such a man? What courage it requires to decline his request!

It is somewhat difficult to say what should be done with the women. While some companies will take them equally with men others decline them altogether, or take them only within specified ages and at an additional premium. It can hardly be called a settled question as yet. My own practice has been to scrutinize them very closely, and take advantage of any objectionable points, points which would not be much regarded if they were men. The common impression has been that they are insurable if the menopause has been passed or if the age of forty-five years has been reached, and the agent appears to be satisfied if he makes this statement. But this discharge continues many times much longer, I must confess to my surprise. And, further, the suspected danger comes not immediately but years afterwards, five or more perhaps. The immediate change is attended with discomfort, but the following years are attended with danger; the development of organic disease is not uncommon. Between the cessation of the discharge and five or eight years afterward is a critical period.

The stated premiums are always supposed to be sufficient to satisfy any losses which may occur. But the ambitions of insurance men are great, and all desire to gain somewhat upon the actuaries' figures; and this appears to me as being very laudable, for some unexpected and extensive mortality may prove very troublesome, and all men are not honest; even some life insurance companies have found this out to their cost. An excess of caution is a sufficient excuse for a balance on the right side of the ledger, against the coming of a "rainy day."

Another factor worthy of consideration is the true force or value of insanity, not in the applicant merely, but in one or more instances in his family. Standing alone, this would not be of much importance, and would be regarded as suffi-

ciently protected by the ordinary premium. But if, in the present or previous generations, a number of such cases are found, the conditions are changed. More especially are such instances to be carefully considered when associated with them we find that a member has died from tuberculosis in some form, or from apoplexy, or from disease of the digestive organs, or from suicide; even if accidental drowning is reported, it adds a suspicion of increased hazard to the case.

Some years ago the average life of the insane was placed at about fourteen years. I am told now that it is considered a few years longer, but that the point is not yet definitely settled. The great care which is now given to the insane affords a probability to an increased longevity. It is not uncommon to hear that an inmate of an almshouse has died at a very advanced age. That which most of these persons need is watchful care, warmth, and food. The brain not suffering from excessive excitements, and the bodily necessities being supplied, the poor mortal leads a sort of vegetative life, until a natural decay occurs.

I trust you will pardon me in introducing some illustrations of the above thoughts, which are interesting to us as medical men, even if they may not be considered as wholly germane to our specialty. The very interesting last report of Dr. H. P. Stearns, the superintendent of the Retreat for the Insane, at Hartford, contains statements regarding the longevity of certain persons in that institution:

1. A female, unmarried, was admitted in 1853, having been insane for seven years previously. At the time of her death she was in her seventieth year, having been 52 years insane.

2. A female, married, lived to the age of 91 years, 8 months, and 25 days, having been insane for 55 years, and continuously in the Retreat 51 years, 7 months, and 25 days.

3. A male, aged 69 years, remained in the Retreat 52 years, 5 months, and 2 days.

4. A female, unmarried, died March 16, 1882, age 69 years, having been insane nearly 54 years, and was the one whose residence was the longest in that institution.

A couple of paragraphs from this report of Dr. Stearns may well close a consideration of this section of my paper:

"Irregular, disordered, or imperfect functional activity of any portion of the great central organ of the nervous system, which presides over and governs the physiological functions of all other parts of the general system, must necessarily limit the normal capacity of those organs, and these effects must be radiated to each part with greater or less intensity.

"Such a morbid character of activities exists in cases of insanity. If the disorder is limited in the period of its duration, its effects very soon pass away, but when it becomes chronic it tends to extend and cripple other parts of the organism, so that the great majority of the chronic insane do not live as long as they would if not insane. There are, however, exceptions to this general rule, and the cases described appear to be good examples. They refer rather to those forms of insanity which have a special constitutional basis, and develop from this in early life. The large majority of cases in the Retreat which have died above 70 years of age have been cases of senile insanity—that is, they developed late in life, and in consequence of old age."

I was much impressed with the paper read a few years since by Dr. Bernacki, of the Germania Company, on the use of beer as affecting longevity. We all agree as to the ill effect of the continued use of ardent spirits; but very likely there is a difference of opinion as to the like effect of beer. This has enormously increased within the last two decades, and has become the favorite tippie of thousands, perhaps of millions, of people. It is very questionable if it is as innocent as is generally supposed. The applicant often acknowledges a use of from two to five glasses a week, "but never to excess." The term "excess" may be one of uncertain or unknown quantity, and therefore dangerous. It may be no more true than the answers which are given as to the causes of death of two generations of the family. In fact, I often wonder at the positiveness with which the answers are stated, and have found nothing like it in making personal

examinations or in inquiries among my friends. Perhaps the increased study of genealogy of late years has brought to light other facts beside an inquiry as to descent from the pilgrims of the *Mayflower* or of the warriors of the Revolution.

Occasionally a truthful James will acknowledge a use of three glasses of beer per diem, but I have known of but one to go beyond this. A line must be drawn somewhere. It may be safe to use a greater quantity than this, and it will be safe not to insure any one who does it. The probabilities are that the amount will be increased and that the expected longevity will be lessened. It is a puzzling problem and, in view of the enormous use of beer, is worthy of our serious consideration. It may be placed along with the influence of albumin in the urine and of heavy and light weights, about which there are such decided differences, but which practically may be regarded as dangerous.

I must be pardoned for bringing before you in a somewhat desultory manner some points worthy of continued investigation. When we look back and consider what was known in the business of life insurance fifty years since, and how much has been learned in the meantime, we shall naturally find that great advances have been made, and hope for still further improvement. Good must come from discussions, which may settle more definitely some points which are fairly open to further investigation. It is with this end in view that these suggestions and reminiscences are respectfully placed before you.

Dr. Young followed with a paper on:

FUNCTIONAL ALBUMINURIA.

Mr. President and Gentlemen of the Association:

In our capacity as medical directors of the various life insurance companies we represent, there is, perhaps, no more perplexing problem confronting us than what disposition to make of those risks where the presence of transient albuminuria is the sole objectionable feature of the case.

In our anxiety to protect the moneyed interests entrusted

to our judgment, we desire to avoid both the error of refusing what may prove to be safe business and the injustice of denying a sound subject the protection to which he may be entitled.

We should welcome, then, all sources of information which tend to throw any light upon the pathology and significance of transient albuminuria, and it would seem we could the more readily attain the end sought by studying the mechanism involved in the production of albuminuria and the physical factors upon which it depends.

So long as the subject remains in the undecided state which it at present occupies, so long will no apology be necessary to justify the frequent repetition of a topic upon which so much has been written and about which so little has been determined.

Permit me, then, gentlemen, in compliance with the request of your president and secretary, to ask your attention to the consideration of the purely scientific element involved in the production of the so-called "functional" albuminuria.

Following Bright's valuable researches in 1827, the profession came to regard the presence of albumin in the urine as a symptom of grave omen, and those in whom this misfortune occurred were condemned to an almost certain death at some period of time not very remote. But when, after the lapse of a few years, it was seen that these evil prognostications were not always fulfilled, a reaction set in, and Gubler and Sutton suggested that albumin might be found in the urine under conditions compatible with perfect health. Then followed a long series of observations and recorded cases in apparent demonstration of this fact. These culminated in the belief among a not inconsiderable number of the profession that albumin was a physiological ingredient of the urine, and might be found in *all* persons at certain times, or even in *all* persons at *all* times, as Senator and Posner affirmed. This, as I hope to show, is going to the opposite extreme, and is calculated, if widely credited, to engender a feeling of false security, which might work serious mischief to mankind. No one doubts the occurrence of an albu-

minuria which does not endanger life, nor even impair the integrity of the kidney, but this is far from regarding it as physiological. It is only another illustration of medical fashion.

The time allotted me will not allow, nor is it my purpose to now consider, the regularly recognized *organic* diseases of the kidneys, but to confine my remarks as far as practicable to that class of cases embraced under the term functional albuminuria, restricting the term to such instances as where the albumin is transient or recurs at irregular intervals of time, and is not accompanied or followed by any recognizable symptom of organic disease of the kidney, local or general.

The term "functional" is perhaps objectionable, but is analogous to that used to designate similar disturbances in the functions of other organs. It seems desirable that the profession should adopt some term suitable to designate this condition, and the one made use of by Millard, *albumina minima*, would appear a very satisfactory one if generally adopted, and the state it is intended to express clearly recognized. For the purposes of this address, however, the term "functional" will suffice.

I also do not propose to discuss the various tests for albumin, nor the many substances with which it may be confounded, but to assume that we are dealing with serum albumin. Nor is it my purpose to consider, excepting perhaps incidentally, the albuminuria attendant upon the gross lesions of the heart or lungs, upon systemic poisoning, fevers, profound blood changes, like purpura and pernicious anæmia, or that dependent upon renal degeneration.

Charcot, in his admirable lectures upon albuminuria, invokes three theories to account for its production. These are:

1. Those cases dependent upon preliminary changes in the composition of the blood. The hematogenous theory.
2. Those arising from vascular changes in the kidney. The mechanical theory.
3. Those due to an anatomical modification of the epithelia and glandular tissue of the kidney. The degeneration theory.

The last class is not included within the scope of this

article. Under the first two may be embraced all cases of functional albuminuria, and as later researches have shown the first, the hematogenous, to have probably been merged into, or connected with, the second, the mechanical, we may at present regard all cases of this form of albuminuria as due to vascular changes in the kidneys, and as capable of explanation upon the mechanical theory. It is from this standpoint I desire to make the following observations. And for the clearer understanding of the subject, permit me, at the risk of being somewhat tedious, to refresh your memories upon those points in the anatomy and physiology of the kidneys which are directly concerned in the production of albumin.

The factors involved are the vessels, the blood, and the glandular secreting apparatus of the kidneys. These organs are richly supplied with arterial blood by the large-sized renal artery, the main trunks of which pass outward as the arteriæ propriæ renales, through the columns of Bertini, forming loops across the bases of the pyramids, from which are given off the interlobular arteries to the cortex and the vasæ vectæ to the pyramids. These vessels give off a comparatively large twig to each Malpighian body as they course through the kidney. Each of these twigs, the afferent vessel, pierces the capsule of the Malpighian body and breaks up into a copious plexus, the Malpighian tuft or glomerulus, and *this* plexus is the part of the arterial system directly concerned in the secretion of albumin. From this plexus arise the radicles of the renal veins, which, however, within the tufts are still filled with arterial blood (Millard). These radicles unite to form a single vein, the vas efferens, which is much *smaller* than the corresponding artery, a point you will please bear in mind in connection with the consideration of those factors which favor renal congestion. After leaving the capsule of Bowman the efferent vessel breaks up into a second plexus, whose capillaries loosely surround the convoluted portion of the tubes, leaving lacuniform spaces, usually filled with fluid, between the walls of the blood-vessels and the urinary tubes. To this arrangement is given the name "labyrinth." These

secondary plexuses of veins constitute the true beginning of the renal venous system and the branches arising from them unite to form the trunks, which, by their union, make the renal vein. The renal veins are not provided with valves, an additional point favoring venous stasis and consequent renal congestion.

The glandular apparatus involved consists of the uriniferous tubules and the epithelium. The former begin as a dilated sac, Bowman's capsule, have a constricted neck, quickly dilate to a diameter of $1/600$ to $1/400$ of an inch, and become very much convoluted, greatly enlarging thereby their secreting surfaces. They next become attenuated, descend into the pyramids as the descending limbs of Henle's loop, and having formed this loop, pass back to the cortex as the ascending limbs, where they again become convoluted, forming the irregular tubules, and finally empty into the collecting tubules, which transmit their contents to the pelvis.

The epithelium of the tubules, according to Heitzmann, is for the most part cuboidal or columnar, assuming these forms in the convoluted portions especially, but becoming flat in the narrow ascending and descending loops of Henle. Heidenhain demonstrated the existence of small rod-like bodies (*stäbchen*) perpendicular to the lumen of the tubule and situated at the deeper portions of the epithelium, where loosely attached to the connective tissue, which rods Klein later showed to be the septa of a reticular network, conforming to the reticulated structure of living protoplasm, and which Heitzmann, Strickler, and Millard have shown to be really a formation of living matter.

As to the physiology of the kidney, it is now generally conceded that the watery elements of the urine are secreted by the glomerulus, this being facilitated by the large volume of its vessels, the thinness of their walls, and the disproportion in size of the efferent vessel, which by its small calibre favors retardation of the blood current. Under normal pressure the equilibrium is maintained by the escape of water, while increased pressure, as from active or passive congestion, must be either compensated for by increased transudation, which

is not infrequently the case, or else result in damage to the organ. This separation of the watery elements of the urine from the blood has been shown by several observers, however, to be not simply a physical phenomenon, but to be performed largely by the epithelia of the glomerulus. It is not merely a mechanical filtration, such as occurs through animal membrane in our laboratories, nor is Ludwig's theory that such is the case, and that the urine so secreted by the glomerulus consists of the water holding the urinary salts preformed in the blood in solution, any longer tenable. This appears from the experiments of Overbeck. This observer found, by passing a ligature around the renal artery so as to be able to compress it at pleasure, that the immediate effect of compression was an arrest of the circulation and consequent suppression of urine. By relaxing the ligature the circulation returned at once, restoring all the elements necessary for simple mechanical filtration, yet the secretion did not begin at the same time, but only after the lapse of one-half to three-quarters of an hour. How then are we to account for this delay? Only by supposing that the epithelia are concerned in the process (for there remains nothing else in which the power could reside), and that these epithelia have been disturbed in their functions by the temporary derangement of their circulation from the application of the ligature to the renal artery. Hence Heidenhain justly argues that the cells are active in secreting the watery elements of the urine, and that the above-mentioned delay is due to their being in a condition of anoxemia, to recover from which and to regain their normal vitality a certain interval of time is necessary. Or again, if the experiment be so varied, by ligating the renal vein, as to not remove the vascular pressure, but rather indeed to augment it, the same result follows—immediate arrest of secretion and the same delay in re-establishing it after the removal of the ligature. The same condition of anoxemia is produced.

The extractive matters of the urine, such as urea, uric acid, etc., are now supposed to be excreted only in small part from the blood, but chiefly formed in the epithelium of the convoluted tubules, really therefore a secretion. While this

is not absolutely demonstrable, experimentation affords strong and convincing grounds for such a conclusion. Thus the experiment of Heidenhain in injecting a solution of indigo sodique showed that this substance was found (by its blue color) only in those epithelia with the rod-like structure, namely, in the convoluted tubules and the ascending loops of Henle, not in the capsule or the descending loops; and if the animal was killed an hour after the injection, it had passed into the lumen of the tube as a crystalline deposit. Again, Schmiedberg and Koch have shown that if benzoic acid and sugar of gelatine be injected into the blood of a dog, and the vessels left free while the ureter is tied, hippuric acid (a combination of these ingredients) will accumulate in the blood, while if the vessels are tied, and not the ureter, none is formed in the blood. Kidney action is therefore necessary to its production by synthesis. Now if this is true as to hippuric acid in the dog, why not so as to urea or uric acid or other extractives in man? We know that a small amount of urea and uric acid exists preformed in the blood, but not at all in quantity sufficient to account for the amount excreted with the urine. Again, if the renal vein be tied, more urea is found in the blood than if the kidneys be extirpated, and, if the ureters be tied, the accumulation is considerable (Millard). Then, too, as Beale remarks, of what use is this extensive system of convoluted tubes and large epithelial glandular surface, if for no other purpose than simply to carry off the urine.

The foregoing experiments would seem to show that the watery elements of the urine are separated from the blood by the glomerulus, while the extractions are partly separated, but chiefly secreted, by the epithelium of the tubules.

Next we have to consider the source of albumin in the urine. If temporary compression of the renal artery be effected by a ligature, and after a short period the ligature removed, as in Overbeck's experiment already referred to, there is for the first half or three-quarters of an hour following its removal no secretion of urine, but at the expiration of that time it again begins, and for four or five hours following the

re-establishment of the circulation it is found to contain albumin. The portion of the glandular apparatus of the kidney concerned in its production is demonstrated by quickly tearing out the organ under the above conditions, viz., when the urine is found to contain albumin after temporary ligation of the renal artery, and throwing it into boiling water, when the albumin is coagulated in situ, or indeed the same can be shown in other conditions where the urine is albuminous. The result is a coagulation of the albumin in the *glomeruli* and the capsules which contain them. Charcot affirms that albumin is always present in some of the cavities of the capsules in all cases of pathological albuminuria, whether permanent or transient, functional or organic.

It is proper to remark in passing that this experiment of temporary compression of the renal artery by ligature is not only followed by albuminuria, but there are also shown at the same time evidences of *acute inflammation* in the glomeruli, which seems to demonstrate how slight a cause may set up inflammatory action, and how false may be the assumption in certain cases of the so-called transient or functional albuminuria that no inflammatory action is present, simply because of our failure to detect some evident cause.

Heidenhain and Millard, as already intimated, explain the appearance of albumin in the urine under the above circumstances upon the assumption that there is produced a temporary condition of anoxemia or deficiency of oxygenated blood, by which the normal cell activity is deranged and its vitality impaired.

The labyrinth does not appear to be involved in the production of albumin directly, but disturbances in its circulation would readily influence that of the glomerulus, which is. The independence of the labyrinth and glomerulus is shown as Charcot points out, in certain forms of cardiac asystolic pressure, in which there is little water, containing much albumin, but a high specific gravity, showing the normal secretion of solids, but not fluids, and in the cardiac kidney, where the urine has long been albuminous, the labyrinthine

cells have undergone no appreciable morphological modification.

The effects of alteration of vascular tension, either active or passive, are clearly quickly felt by the glomerulus, which presides over the secretion of water and albumin, while a much longer time, and one that may be very much extended, is needed to produce pathological changes in the labyrinth. Now, as some alteration in vascular tension constitutes the first link in the chain of events which go to make up the pathology of inflammatory affections, to which those of the kidney are no exception, we can readily understand why albuminuria *precedes* the other symptoms in cases which go on to the development of chronic disease, or why it may disappear after an interval of less or greater duration, according as the cause operating to produce such tension is or is not easily removable.

That albumin is a product of the secretion by the epithelial cells is further illustrated by the pathological history of croupous nephritis, in which the cells are found undergoing various changes from simple cloudy swelling to marked fatty or granular degeneration and in which, according to Millard, albumin is *never* absent. On the other hand, in interstitial nephritis, where the epithelial cells have been destroyed albumin is far less common, often scanty, or even absent.

When we come to study the effects of vascular changes in the kidneys in producing albuminuria we find that pressure, whether increased or diminished, is not the important factor in its production, but that the *essential* point is diminished velocity, which permits the prolonged sojourn of the slightly oxygenated blood in the renal capillaries. An increase of pressure, with increased velocity, results in an increased secretion of urine, but no albumin; while, on the other hand, either an augmentation or diminution of the pressure, with diminished *velocity*, causes the urine to become rare and at the same time albuminous. The experiments of Overbeck, Goll, and Stockvis have shown that by means of a special instrument, exercising pressure in the renal *artery*, we may produce an absolute or relative blood stasis without augmented pressure, the pressure diminishing in proportion as

the circulation is retarded. There is also a diminution in the swiftness of the blood current, and we have the two factors—diminished pressure and diminished velocity. The result is albuminuria. The same effect follows the similar condition which occurs in arterial stenosis. If now we partially compress the renal *vein*, instead of diminishing, we increase the blood pressure, but the velocity is diminished as before. The result is the same. The urine becomes rare and albuminous. If ligature of the vein is complete and permanent the urine is at first suppressed, but after a certain time becomes rare and albuminous and so remains. Next, if we ligate the aorta below the origin of the renal artery, or ligate a number of large arteries, the renals excepted, so as to throw upon the renals a great addition of blood, we produce augmented pressure and increased velocity. Albumin fails and the urine is abundant, so that the theory that great arterial congestion alone produces albuminuria is not tenable. Charcot explains the occurrence of albuminuria in interstitial nephritis with cardiac hypertrophy, which seems opposed to this experiment, by affirming that it is not the consequence of increased pressure in certain glomeruli, which have remained healthy, but is due to obstacles to the circulation which have produced increased pressure but diminished velocity in the altered glomeruli, and hence the albumin. In this combination we have first healthy glomeruli, in which there is increase of pressure and increase of velocity—hence water is abundant; secondly, some glomeruli are profoundly altered, and in these there is diminished velocity, more or less constant—hence more or less constantly albumin; and finally, some are destroyed and do not functionate.

When we come to act directly on the heart, we shall see how important is this organ in producing the necessary conditions in the circulation of the kidney, which favor the secretion of albumin. Overbeck showed, by introducing a hollow instrument with a bladder at its end into the right ventricle and then inflating the bladder, that the arterial pressure fell from 137 mm. of mercury to 25 mm. Here the capillary circulation was clogged and the venous pressure

rose, while the velocity of the blood was diminished at the same time that arterial pressure was lowered. Here again the urine became scanty and albuminous. A condition approximating that produced by this experiment would be strongly realized in those conditions which diminish arterial pressure and favor venous stasis, such, for instance as, cardiac disease without compensation, mitral regurgitant lesion, aneurism, or a heart enfeebled by fever or disease, or in certain pulmonary impediments to circulation, such as pneumonia, intense congestion of the lungs, emphysema, hydro-pneumothorax, etc.

It does not follow that all such affections necessarily produce augmented pressure in the glomeruli, for it is found that venous injections do not easily reach them, notwithstanding the absence of valves in the renal veins, the explanation being that the venous plexuses about the convoluted tubes would be the first to feel the influence of venous stasis, and only through the efferent vein, which, as has been stated, is relatively small, can the backward pressure be finally transmitted to the glomeruli; but whether the pressure be augmented or not, the important factor, diminished velocity, is present. This anatomical arrangement may be in a measure a conservative one for the economy, and will serve to some extent to explain why albumin is not a constant factor in all instances where the pathological elements favoring venous stasis might be reasonably supposed to be present.

To sum up, the results of the above-detailed experiments, performed upon healthy kidneys, prove that albumin is a secretion of the epithelial cells of the glomeruli and takes place within the capsule of Bowman, and that the necessary condition to produce this effect is a retardation of the blood current through the vascular plexus, which enters into the formation of the glomerulus; and, further, that the secretion of albumin is due to anoxemia or a diminution in the oxygen of the blood while circulating through the tuft.

As before stated, it is not my purpose at present to make an application of these principles to the regularly recognized organic diseases of the kidneys, although such would best

exemplify their truth, but to limit their application to the class of cases under consideration.

In considering functional albuminuria two questions at once arise. First, Is there a physiological albuminuria; that is, is albumin a constant element in the urine? Second, Is albuminuria produced in any other way than by some derangement of the circulatory or glandular apparatus of the kidney.

I. That albumin, by which we refer to serum albumin or serine, with which, however, a certain amount of globulin is usually associated, may occur in the urine of the apparently healthy, and even persist for a long time without leading to recognizable disease, is generally admitted, but that it is to be found in all urines, or even in the very large percentages claimed by Capitan, Chateaubourg, Norden, Senator, Posner, and others must be disputed. It is inconceivable that such should be the case when we consider how universal and common is the custom of examining the urine in general practice, and particularly in life-insurance examinations, which run up into the thousands, without finding albumin, except in a very small percentage of cases (2 per cent.). Of course it may be argued that the greatest care and the most delicate tests may not have been employed, but even allowing for this, it will not account for its absence in 98 per cent. Millard reports having made a large number of examinations of urine in persons unaffected by any renal disease, yet the most of them suffering from some derangement of health, often serious, without finding a trace of albumin by either nitric acid, heat, or his own test. By collecting the urines of all the surgical patients in St. Michael's Hospital, most of them healthy people apart from the injuries for which they were undergoing treatment, I was enabled to find by Millard's test albumin in 16 per cent. only, and this in cases suffering from such affections as abscess of the neck, arterial angioma, fracture of the femur, amputation of the leg, caries of the femur, compound fractures, excision of the knee-joint, etc. In 11,000 cases examined for the Mutual Benefit Life Insurance Company, whose records were otherwise unobjectionable,

albumin was found but fifty-four times, the tests commonly employed being heat, or nitric acid, or both. The experience of other companies shows similar results, the average being placed at about 2 per cent., or under, exceptionally as high as 5 per cent. Goodheart, of Guy's Hospital, found albumin in 272 out of 1500 cases examined by him, but in only 39 was no organic lesion discoverable, the latter number only coming under the class of which we are speaking.

On the other hand, Capitan and Chateaubourg claim to have found albumin in 80 to 83 per cent. of 208 healthy children from one and a half to eighteen years of age; in 82 per cent. of healthy soldiers five hours after meals; in 76 per cent. of healthy soldiers whose urine was collected at 5.30 A.M.; and in 87 per cent. of the same after they had undergone severe and prolonged exercise.

Norden found albumin in 43 per cent. of cases of soldiers after exercise. Senator claims that albumin could likely be found in all healthy urines, did we possess sufficiently delicate tests, and Posner affirms that he *can* find it in all by his own test. Millard has shown Posner's test to be faulty, however. Lecorché, in commenting on the instance where Chateaubourg found albumin in 201 out of 230 samples of urine passed by soldiers after exercise, considers that this author has arrived at exaggerated and false conclusions by not allowing for the precipitation of mucin by the test employed (Tanret's). The augmentation of mucus is appreciable after exercise in perfectly healthy persons, and distinctly so where there exists irritation of the urethra, bladder or prostate, gonorrhœa, or cystitis. Besides, other elements containing protein substances, such as the detritus of broken-down epithelium, leucocytes, pus corpuscles, liquor puris, etc., give many of the reactions of albumin. Moreover, it does not appear from the failure to employ the microscope that some of those cases may not have shown evidences of a renal lesion. But even admitting the accuracy of the observations, they do not prove albuminuria to be physiological, in that they do not account for those cases in which it is absent.

As to Senator's claim that all urines would be found to

contain albumin if we possessed sufficiently delicate tests to detect it, Millard quotes from Lecorché and Telamon the following comment: "Tanret's test will detect one part albumin in 200,000, and Millard's one in 300,000; that is, five to three milligrammes to the litre. Urine, supposing it to contain albumin, which gives no reaction with these tests, must then contain less than three milligrammes to the litre. If, then, the renal filtration is such that it will not allow five milligrammes ($\frac{1}{15}$ grain) to pass in twenty-four hours, we may admit it will not allow the slightest trace to filter through."

Now if albumin was a physiological constituent of the urine, we could easily understand certain variations in its quantity within the limits of a normal circulation in the glomerulus, but if it is not we must infer some change therein as essential to its production. Certainly it has not as yet been shown to exist as a normal physiological ingredient in the urine.

II. Is it then produced in any other way than by some derangement of the circulatory or glandular apparatus of the kidney?

It is a matter of frequent observation that the ingestion of food favors the appearance of albuminuria, the more especially in those cases where any predisposition already exists. This occurs particularly after a meal consisting largely of nitrogenous food. Grainger Stewart found albumin in 35 per cent. of 160 cases examined by him after breakfast; Finot in 11.6 per cent.; and Capitan and Chateaubourg in 45 to 82 per cent. in 192 cases, three to five hours after a meal.

Claude Bernard, Christison, Seé, Ferret, Norden, and others have all reported albuminuria after eggs were freely taken. Bernard experimented on himself, but finally died of Bright's disease, as did also the cases reported by Christison and Seé. On the other hand, Stokvis, Lauder Brunton, Maguire, Griswold, and other observers have attempted to induce albuminuria in themselves by taking from six to ten eggs, either once or several days in succession, but without finding a trace of albumin in the urine passed for the following forty-eight hours. Lecorché and Telamon fed four tuber-

culous patients, for eight, ten, and fifteen days, the whites of six eggs, but in only one of these, a case with hectic fever, was any albumin found, and in this one a trace only was detected four times in three weeks. This demonstrates the fact then that the ingestion of large quantities of egg-albumin does not *always* produce albuminuria. Nor does the albumin, when found, give the reaction of egg-albumin as a rule. Ferret is the only one who has detected the reaction of egg-albumin, and to show this the urine must contain one gramme at least to the litre.

Grainger Stewart has shown by a series of experiments that the albumin in these cases is serum-albumin and that the quality is always *small* in amount, so that we cannot account for its appearance on the ground that the egg-albumin is transformed by digestion into serum-albumin and secreted as such.

Now Semmola, in experiments on dogs, has introduced large quantities of egg-albumin by the stomach, the veins, and subcutaneously, and the animals, when killed and the kidneys examined, have *invariably* shown the lesions of well developed glomerulo-nephritis. It is likely, therefore, in those cases where albuminuria is found after the ingestion of nitrogenous food (which includes casein and gluten as well as albumin) that, through some disorder of digestion, peptonization is impaired, the albuminoid is absorbed in some changed condition as a hetero-albuminoid, circulates in the blood as a toxine, and by its irritant qualities as such excites a toxic glomerulo-nephritis.

As accessory causes in producing these results we may instance, on the authority of 'Drs. Arthaud and Butte, the vaso-motor disturbances consequent upon irritation of the vagus, or, as Da Costa shows, the increase of uric or oxalic acid, to which I shall refer later, and, finally, the increase of salts and urea incident to such a meal as we are considering, and which, by their presence, as Hoppe-Seyler has shown, favor the transudation of albumin.

Even then dietetic albuminuria, with excess of nitrogenous food, the form which would *a priori* seem to favor the

secretion of albumin without circulatory disturbance of the kidney, has not been demonstrated to occur independently of such changes, but rather the reverse, as Semmola's investigations show. The theory of Thomas Oliver, based on experiments by Rolfe and Noël Paton—that urea is mainly formed of red blood globules and most when the liver is in the highest digestive activity, and hence that when that organ is unusually stimulated by an excess of nitrogenous food more albumin would be liberated by the destruction of the corpuscles than could be at once transformed into urea, and consequently the excess would appear in the urine—would furnish another explanation for an excess of albumin in the blood, but not for the mode by which it is eliminated by the kidneys. It matters not what the changes in the blood, whether excess of albumin, hetero-albumin, uric or oxalic acid, excess of urates, or other agents, the dogs in Semmola's experiments, when killed, invariably showed signs of glomerulonephritis.

There are many other changes inducing albuminuria, which occur in the blood in various diseases and fevers, and from the admixture of chemical or dissolved irritants, but these are acknowledged to induce renal changes, and it would thus appear that we have as yet no pathological proof of albuminuria ever existing without them.

So far as our knowledge goes, it is highly probable, then, that all albuminurias independent of glandular changes in the kidneys are to be explained on the mechanical theory. Even with glandular changes the mechanical effects of alterations in the circulation are still important factors in their production. We have seen from experimentation on animals that the conditions favoring albuminuria are, as before stated, a retardation of the circulation, with either active or passive congestion, and the production thereby of a state of anoxemia or deficient oxygenation of the epithelial cells. As the blood in the kidneys is naturally highly oxygenated, even in most of the veins, the organs would be quick to feel the effects of stasis, particularly venous, and a state of anoxemia would be easily induced, so that causes apparently

trivial in their nature might, under certain conditions, be sufficiently potent to produce albumin in the urine. The pathological elements serving to produce the above results may be classified as follows: Those which increase or diminish arterial pressure by exaggerating or diminishing the heart impulse; those which act through the sympathetic system by inducing vaso-motor paralysis or spasm; those increasing venous pressure, which include all causes favoring venous stasis, such as phlebitis, pressure on the veins, many pulmonary affections, enfeebled heart action, valvular lesions with incompetency, sympathetic paralysis, etc.; those acting as local irritants; those favoring carbonization of the blood; and, lastly, those which combine two or more of the above elements, which probably is the case in the vast majority of instances.

Turning now to the causes which incite albuminuria, we shall see that all evidence tends to show that one or more of the foregoing conditions are present. There are four special types, under which are embraced probably all instances of functional albuminuria, viz.: those arising from muscular activity; those dependent upon some fault of innervation; those due to dietetic causes; and, finally, those due to local irritation.

Great prominence has been given to muscular activity. Perhaps the simplest form of this is illustrated in the so-called postural albuminuria. It is a well-known fact that albumin is less marked and constant in the recumbent position, even in those suffering from organic albuminuria, although it is usually absent in the class of cases we are considering, yet as soon as the erect position is assumed and even a moderate amount of muscular activity is exercised, albumin may appear.

Dr. Clement Dukes, physician to the Rugby School, reports some striking instances illustrative of this point. By a change in the regulations the whole school was required, two days in each week, to repair to a large hall for a fifteen-minute prayer-meeting, during which time they were compelled to *stand*. On other days they met in the chapel, where *seats* were provided. It was exceedingly rare for a boy to

faint in chapel, but it became a common occurrence when prayers were held in the hall. Dr. Dukes found the sufferers to have hard, rigid pulses, and in nearly every instance albuminuria was discovered. This he ascribed to a hyperemia of the kidney, due to a condition of the circulation pure and simple, and indeed no other explanation seems probable. It is likely two circumstances contributed to derange the circulation, viz., the somewhat weakened state of the heart and a temporary cerebral anemia, exercising a vaso-motor influence, both resulting from the long interval since food was taken. No mention is made as to whether the boys had breakfasted, but it was evident they had not, for they arose at 6.40 and rushed down to prayers at 7 A.M. When seats had been provided in the hall the difficulty ceased at once.

T. Grainger Stewart relates the case of a young lady whom he observed for a long time, where no albumin could be found before rising, but became abundant within 45 minutes after she had moved about in the act of dressing. On one occasion she arose at 5 A.M., dressed and walked about for 45 minutes. The urine, which was free of albumin on rising, contained an abundance of it after the walk. She returned to bed, and by 7 A.M. only a trace was detected, when she again arose and in 45 minutes albumin was abundant as before. Stewart attributed these effects to vascular changes in the kidneys, a belief thoroughly justified by what takes place if we carry the illustration up to the opposite extreme, *excessive* muscular activity.

Andrew Macfarlane found, in *every* case of 29 football players, in the urine passed immediately after the game, albumin varying in quantity from a trace to a ring $\frac{1}{4}$ inch in depth. More than this, nearly all showed casts, either hyaline, epithelial, or granular, and a few even blood casts. Oxalates, urates, and uric acid were present in abundance and in some there was blood. Now these players, it is presumed, were specimens of perfect health, and violent muscular action was undoubtedly the potent factor in producing the albuminuria, although mental excitement, cold bathing, and nitrogenous diet exercised no inconsiderable influence as ac-

cessory causes. The albumin disappeared after a few hours. From the presence of casts and even blood there can be no doubt that an acute congestion of the kidneys was present in these cases, to which was superadded a weakened heart's action from fatigue, a concentrated urine from copious perspiration, and the irritating effects of an abundance of oxalates and uric acid, which conditions are the very ones that experimentation has shown to favor the production of albuminuria. Such, then, being the consequences attendant upon severe muscular exertion, we are abundantly justified in placing under the same category those instances of albuminuria, not so constant or pronounced, which arise from the less violent exercise of marching, riding, running, prolonged walking, and especially fencing.

There is a large class of cases of the form of albuminuria we are considering, which has been described as *neurotic*. Runeberg says these are due to some modification of the action of the heart or blood-vessels through the influence of the vaso-motor nerves, which implies some variation of pressure, which variation may depend upon dilatation of arteries through paralysis, or contraction of the same through cramp or spasm.

He has shown that *irritation* of the renal nerves produces contraction of the minute arteries of the kidney and albumin appears in the urine. This contraction of the vessels diminishes arterial pressure, retards the circulation, and by limiting the amount of arterial blood tends to produce the condition of anoxemia, to which we have before alluded. The appearance of albumin, then, is what we should expect, in conformity with the experience of Overbeck. *Section of the renal nerves*, by producing a limited vaso-motor paralysis, confined to the kidneys only, was found by Runeberg to not sufficiently influence blood pressure to produce any material interference with the secreting function of these organs, and no albuminuria followed, but Foster found that *section of the spinal cord* below the medulla so diminished the circulation in the kidneys, by inducing a general vaso-motor paralysis, and thus retarding the circulation of the entire body, as to

result in a great decline or arrest of the urinary secretion and the appearance of albumin. The same observer shows that stimulation of the cord below the medulla is followed by increased pressure in the larger vessels and constriction of all small ones, the kidneys becoming pale and bloodless and their circulation thereby retarded, favoring the secretion of albumin.

Claude Bernard long ago demonstrated that puncture of a certain point in the floor of the fourth ventricle produced vaso-motor paralysis, the same as after division of the cord, and as a consequence diminished urine and albuminuria.

Drs. Arthaud and Butte have contributed to the pathology of neuropathic albuminuria some interesting observations relating to the pathological physiology of the pneumogastric nerve, as cited by Millard. "These refer especially to a nephritis of a special type, characterized by the pre-existence and co-existence of symptoms of the viscera innervated by that nerve. They describe first a period of gastro-pulmonary-cardiac troubles, then a period in which transient albuminuria is found, and, finally, permanent albuminuria, with fully developed Bright's disease, if the affection be not sooner arrested. The early stages of these cases illustrate the effect of irritation of the pneumogastric nerve in producing vaso-motor disturbances in the circulation," which, carried beyond a certain point, culminate in classic Bright's disease, and serve also to aid in explaining the origin of dietetic albuminuria, as previously remarked.

Violent irritations of the skin by extensive burns, strong applications, or severe chilling, produce similar effects through their action on the vaso-motor nerves. Thus Ritter has demonstrated the existence of hyperemia, and even inflammation of the kidneys in rabbits, after shaving them and then immersing them in water at a very low temperature, and even producing albuminuria at will by repeating the experiments on those animals which survived the shock. Autopsies have shown the same pathological changes in cases of death from extensive burns and strong cutaneous applications.

From these illustrations it is seen that vascular changes

in the kidneys result from those causes which disturb vaso-motor innervation. This affords us the most likely explanation of the cases of albuminuria which arise from reflex irritation, many of them of apparently trivial character. Thus Capitan has shown that transient albuminuria may be induced by such simple reflex action as irritation of the auditory nerve (by a series of rapid detonations), or of the retina by strong light, or by irritating the solar plexus, by hypodermic injections of chloroform, by cutaneous irritation, or by lowering or elevating the temperature of the body, etc. It has been known to come on after such slight causes as anger, simple nervous excitement, and prolonged mental action. In delirium tremens Ellis states that it occurs in 40 per cent., and the amount is in proportion to the delirium and not the activity of the seizures. It is likely in this affection, however, that the toxic local action of the alcohol plays no insignificant part in intensifying the effects of vaso-motor disturbances of the heart and vessels. Exophthalmic goitre, by causing a general vaso-motor paralysis, is found to be accompanied by albuminuria in a considerable number of cases. The more important diseases of the brain and cord profoundly affect vaso-motor innervation, and albuminuria is present in a notable proportion of the cases. But these major affections, while owning a similar origin, are not strictly within the limit of those we are considering. We may fairly include, however, the transient albuminuria arising from the shock and sympathetic paralysis, which sometimes follows severe injuries or operations, and that which succeeds, although often at a long interval, debilitating disease, such, for example, as diphtheria, in which there is a lack of tone and innervation.

The sensitiveness of the vaso-motor system to the slightest forms of nervous irritation or excitement, as, for instance, in blushing, shows how trifling may be the excitement, which will produce through their agency very sensible changes in vascular action. It is quite likely that the major portion of the cases of functional albuminuria, the source of which is difficult or impossible to explain, owe their origin in large

measure, if not wholly, to some form of irritation acting upon those portions of the nervous system which preside over the vaso-motor nerves. This is notably so in those instances characterized by the formation of an excess of uric acid and oxalate of lime, in which nervous derangements are such prominent features.

It must be remembered that vaso-motor paralysis not only influences arterial pressure, but the venous as well, and that when at all general its influence on the heart and pulmonary circulation strongly tends to augment venous stasis, and thereby its effects on the renal circulation. Venous stasis is also favored by the rapid breathing incident to severe muscular exertion, which by inducing pulmonary congestion materially checks the flow of venous blood through the right side of the heart. With the gross lesions of the heart and lungs, and other causes which favor venous stasis, we are not at present dealing.

Still another form of functional albuminuria is that which depends upon conditions which produce *local irritation* of the kidneys. These irritants are for the most part the result of defective metabolism and arise from mal-assimilation and tissue-waste. They include such as originate from a concentrated condition of the blood, as, for example, after violent muscular exertion, or from certain chemical irritants, the products of defective digestion, or bile, but especially from uric acid and oxalate of lime. W. W. Gannett has found glomerulo-nephritis, where bile was the irritant. Da Costa has recorded some typical cases dependent upon the presence of uric acid or oxalates, or both. Each of these classes presents marked dyspeptic and nervous symptoms, showing in the main the same general features, which, however, are somewhat more pronounced in those due to oxalates. The urine shows usually a high specific gravity, and may persist as high even as 1.036, and deposits urates, uric acid, or oxalate of lime. The total solids are increased. Not uncommonly there is an increase in the chlorides, phosphates, and urea, the last often much so in the cases with oxalates. The amount of albumin is generally small and apt to be in-

termittent. Great care in testing is required, not to confound it with mucin, which in this class of cases is often very great.

The albuminuria of adolescence Da Costa believes to be in the majority of cases the albuminuria of uric acid and of oxaluria. Those cases he noted showed marked debility, nervous and digestive disorders, albuminuria intermittent, the amount of albumin varying, usually small, the urine of high specific gravity and abounding in urates or oxalates or both, and he raises the question whether this tissue-waste, with its uric acid and oxalates, may not account for the most of the so-called intermittent, functional, or cyclic albuminurias, as he believes it does, and whether, too, the so-called physiological albuminuria of forced exercise is not of similar origin. The twenty-nine cases of football players recorded by Macfarlane, it will be remembered, all showed an abundance of oxalates, urates and uric acid, and casts sprinkled with crystals were found in some of them. The pathology of these cases Da Costa regards as essentially a congestion of the kidney, with, should the hyperemia persist, slight local inflammatory changes, due to the irritating effects of excreting these waste products. The seat of this congestion is primarily in the labyrinth, which, as we have seen, performs the duty of secreting the salts of the urine, while the glomerulus is affected only secondarily.

Under this heading may properly be included *dietetic* albuminuria, the essential features of which may be gathered from what has already been said in speaking of the so-called physiological albuminuria, etc.

By far the greater number of cases of functional albuminuria, however, arise from a combination of the causes mentioned. Yet whatever may be their origin, all evidence points toward a local vascular change in the kidney as a condition necessary to their production. As such cases are not fatal, we are unable to absolutely demonstrate this point by autopsical observations in the human subject, but the results of experimentation on animals and reasoning by analogy leaves practically no doubt of its truthfulness. Moreover,

Millard and Shattuck affirm, as the result of many studies of the kidneys after death, that it is rare not to find certain scars, contractions, destruction of Malpighian bodies, glomerulitis or other evidences of old lesions, which had healed after local disturbance or inflammation at the time of a latent albuminuria.

In the light of our present knowledge, then, we are forced to regard functional albuminuria as an evidence of local vascular disturbance in the kidney, or as a glomerulitis or glomerulo-nephritis, and as explainable on the mechanical theory. Doubtless the condition is often a transient one and easily removable. Were it always uniform, and did it always follow certain definite causes under similar conditions existing in different individuals, we might hope to definitely estimate its significance, but its irregular and capricious character renders its explanation more a matter of speculation than positive demonstration. In a few instances perhaps we can satisfactorily determine its cause, as, for instance, in the cases of the football players recorded by Macfarlane, where its origin was too plain to admit of doubt, but until the distinction between it and the onset of that form of albuminuria which leads ultimately to chronic organic lesions can be definitely established, we can not in all instances differentiate between the two.

Certain indications may point one way or the other, but time and the subsequent history can alone determine which form is present, with any approach to certainty.

If, as we have reason to believe, some lesion of the kidney, however slight, be present in all cases of functional albuminuria, we cannot view the long continuance of the latter otherwise than with apprehension. Even in its more transient forms, we can scarcely regard its occurrence without suspicion, when we recall how frequent is its absence, where the conditions which we have seen to favor its production are conspicuously manifest, a circumstance that implies some *individual* peculiarity or predisposition whose influence we can not fully estimate. And until we can do this, by means more certain than any we as yet possess, it behooves us to resist the some-

what growing tendency to lightly regard the significance of functional albuminuria, by the careful and continued watching of each individual case, while at the same time avoiding any unnecessary alarm over what may ultimately prove but a slight disorder.

If the points for which we are contending be true, we must deny the existence of a physiological albuminuria and regard all instances of albumin in the urine as of pathological origin. Its significance will depend upon our ability to determine the *underlying causes* which favor its production in any given case and, from a life-insurance point of view, these causes may in themselves be as serious a bar to the safe acceptance of a risk, or even more so, than the albuminuria, that may possibly be but *one* manifestation of some important changes taking place within the system. At all events, an applicant whose urine contains albumin presents himself as a damaged risk and the burden of proof rests upon him. In the nature of our business it is impossible for us, as a rule, to follow such a case to a satisfactory conclusion—as we might in general practice, when we can retain control of a patient—so that our only recourse appears to be either to decline the risk or postpone it for further investigation, for until we can have satisfactory data upon which to base our judgment, its acceptance would be a matter of pure hazard, based on chance and not on reason.

Dr. S. Glover Lyon read a paper on "Uniform Blanks."

These papers were then discussed by Drs. Wilkins, Huntington, Grant, Shepherd, King, Emery, Curtis, Marsh, Russell, and Morgan.

The subject appointed by the Executive Committee for general discussion, "The Factors Governing the Value of Risks after Middle Life," was then taken up and discussed by Drs. Russell, Curtis, Wells, Devendorf, Thorburn, Scott, Shepherd,

Kucher, Hamill, Marsh, Morgan, Northcott, Homans, Chapin, Emery, Rogers, Wilkins, and Munn.

Upon motion of Dr. Grant a note of thanks was extended to the New York Life Insurance Company for its hospitality.

Upon motion of Dr. Marsh the reading of the minutes was dispensed with, and it was recommended that they be submitted to the Executive Committee, and then printed.

Upon motion of Dr. Wells it was decided that the next meeting of the Association be held in Montreal.

Upon motion of Dr. Rogers the Secretary was instructed to extend the thanks of the Association to the Hartford Companies for their kind invitation to hold the next annual meeting of the Association in that city.

NINTH ANNUAL MEETING.

The Ninth Annual Meeting of the Association was held at the Windsor Hotel, Montreal, on July 6th and 7th, 1898, the President, Dr. H. Cabell Tabb, in the Chair.

The following members were present: Drs. Buraige, Davis (C. W.), Devendorf, Emery, Fisher, Grant, Holden, Homans, Northcott, Prime, Shepherd, Storrs, Tabb, Tuck, Vander Poel, Webb, Wells (F.), White, Wilkins, Woolverton, and Woods.

In the absence of Dr. Rogers, Dr. White was chosen Secretary *pro tem*.

The minutes of the last annual meeting and of the

meetings of the Executive Committee were read and accepted.

The following were unanimously elected to membership:

Dr. W. R. Bross, of the Equitable Life.

Dr. W. R. Prime, of the Vermont Life.

Dr. J. F. W. Ross, of the Manufacturers Life.

Dr. H. P. Strathy, of the Manufacturers Life.

Dr. S. O. Vander Poel, of the New York Life.

Dr. A. Woolverton of the Federal Life.

Dr. Grant was elected Treasurer *pro tem*.

The following officers were elected:

PRESIDENT.

DR. H. CABELL TABB.

1ST VICE-PRESIDENT.

DR. G. R. SHEPHERD.

2D VICE-PRESIDENT.

DR. J. H. WEBB.

SECRETARY.

DR. O. H. ROGERS.

TREASURER.

DR. J. W. BRANNAN.

EXECUTIVE COMMITTEE.

DR. EDWARD CURTIS.

DR. ALBERT WOOD.

DR. A. HUNTINGTON.

DR. GRANVILLE M. WHITE.

The recommendation of the Executive Committee that the Constitution be amended with reference

to the election of honorary members, as follows, "honorary members shall be chosen by the association in the same manner as active members," was referred back to the Secretary to be brought before the Association at its next meeting.

It was resolved (Dr. Wells) that the Executive Committee be empowered to invite distinguished medical men to be present at its annual meetings as guests, or for the purpose of reading special papers.

A paper by Dr. Thorburn, "Female Risks," was read by Dr. Webb in the absence of the author.

NOTES ON FEMALE RISKS.

In view of the ever-increasing number of females who are seeking employment and who are wage-earners, the question of the value of female life for purposes of life insurance is one which of recent years has been prominently brought to the notice of medical directors of life insurance companies. Fifteen or twenty years ago the number of female risks undertaken was very few compared with those at present assumed, and where insurance was sought by the gentler sex an empirical extra premium was charged, or the risk was immediately declined. In fact, it is the custom of some companies even now to reject applications for life insurance on females. Men are no longer the sole wage-earners; women now engage in many of the pursuits and callings in which men are employed. They are frequently compelled to sustain themselves or contribute to the support of a household; they may also have to make future provision for themselves or for others. When we look around at the different avenues which have been opened up for female service, when we see women teachers, stenographers, typewriters, nurses, saleswomen, clerks, book-keepers, merchants, milliners, dressmakers, artists, designers, authors, agents, artisans, printers, physicians, preachers, &c., it must be very evident that they are entitled to the benefits of life insurance to a very appreciable extent.

It has been stated, and I think with considerable force, that every life which earns money has a financial value, the failure of which life represents so much capital lost and the replacement of which can be most effectually secured by life insurance. If this be admitted, there can be no question but that females are entitled to the benefits which the beneficent system of life insurance grants. That there are difficulties surrounding the insuring of females must be evident to every one who has given the matter careful consideration and who has had practical experience. The conditions of female life are entirely different from those of male life, and upon first consideration the inexperienced might claim that life insurance was never intended for women, except in so far as they should benefit directly by the death of the assured. That this is entirely fallacious needs no argument on my part, but I think that it may be at once accepted that there is at the present day, among a certain class of females, as important need for life insurance as exists among the sterner sex.

In these notes I propose to refer, (1) to the experience of life insurance companies in respect to female mortality and their experiences; (2) to the conditions attendant upon the insuring of female risks; (3) to the companies' practice in granting policies to such persons, and to conclude by a few practical observations.

(1) EXPERIENCE OF LIFE INSURANCE COMPANIES.

(a) *John Hancock Mutual Life*, 1863 to 1883.—It is pointed out that the number of female risks was too small to render the company's experience of value for statistical purposes. The results, however, show that the company's experience regarding female risks was not satisfactory, and that the usual extra premium of $\frac{1}{4}$ % charged on such risks was none too high.

(b) *Connecticut Mutual Life*, mortuary experience, 1846 to 1878.—For age groups 7 to 45 the death-rate is largely in excess of the death-rate of male lives and of the table rate;

while for age groups 46 to 80 the death-rate is below that for male lives as well as below that of the table rate.

(c) *Provident Life and Trust*, mortuary experience, 1866 to 1885.—The experience shows that the death-rate among females is higher than among males; the figures go to show that above age 50 the female lives are better than the male lives, but at younger ages are worse, and particularly so under the age of 20.

(d) *New England Mutual Life*, mortuary experience, 1863 to 1892.—This company's experience when compared with similar female experiences is favorable, but when compared with the company's male experience indicates that female life was not so favorable as male life and that there was a marked selection against the company under policies of more than average amount.

(e) *Australian Mutual Provident Society*, mortuary experience 1849 to 1888.—It is the practice of this society to add a loading of three years to the ages of all females within the child-bearing period. Where the assumed (or increased) ages are dealt with, the actual deaths among females are considerably less than the number expected, according to the society's general experience; even when only healthy lives are dealt with, the actual mortality among female lives is not materially in excess of that among male lives.

(f) Institute of Actuaries' Experience, 20 British Offices' and 30 American Offices' experience.—Both of these extensive experiences indicate that female mortality between 20 and 45 is greater than male mortality between these ages, but that female life after age 45 is more favorable than male life after that period.

(g) Ten Scottish Assurance companies' experience, 1815 to 1863.—This experience demonstrates that the difference between mortality of males and females is much greater in insured life records than among the general population. Out of an equal number of males and females alive at age 10, it is shown that a larger number of females die up to age 45. Thereafter the males suffer the greatest mortality.—(J. I. A., XIX., 200.)

(h) *Metropolitan Life Insurance Society*, England, mortuary experience, 1835 to 1890.—Female lives are shown to be, on the whole, superior to male lives; an experience at variance with that of most offices.

(i) *Scottish Equitable Life* (J. I. A., XXI., 226).—The number of females that enter into the experience is 2205 and the total years of life 30, 521; the number of deaths is 668, and the average time for which the lives were under observation is nearly fourteen years. While the number is somewhat small, the experience is described as an unusually mature one. The deaths being compared with those that might have been expected, according to the usual British Standard of Healthy Male Lives, namely, Institute of Actuaries' Healthy Male Table—to ascertain whether the mortality among females differed so materially from that among males as to justify the extra premium of \$2.50 per \$1000 up to age fifty, so usually charged by British companies—the results show that from 27 to 45 female mortality exceeded the expected, according to the standard adopted, and that under 27 the experience was favorable. It is calculated that the excess of mortality between 27 and 45 would be met by an annual charge of 2 shillings and 10 pence per 100 pounds. From ages 46 to 55 the female mortality is almost exactly the same as the standard adopted; while from ages 56 to 58 the female mortality is considerably less than the standard.

(j) German female mortality,—the *Germania*, a prominent German life insurance company, notable in its own country for writing female risks, has made an investigation of its experience. No marked increase of mortality is revealed as arising from undue proportion of sexual maladies, the fatalities having a general etiology. The insured were mainly married, of the middle or higher class; 65,145 lives were included in the observation. The average insurance duration was 7.15 years. Below is given for every second age up to 40, and for every second age from 52 to 60, the death-rate of this company, together with the death-rate for female lives in the German Empire.

AGE.	GERMANIA COMPANY FEMALE LIVES.	FEMALE LIVES GERMAN EMPIRE.
20	.94	.61
22	1.05	.70
24	1.16	.78
26	1.17	.85
28	1.09	.91
30	1.25	.97
32	1.17	1.02
34	1.12	1.08
36	1.32	1.14
38	1.27	1.19
40	1.15	1.22
52	1.67	1.80
54	1.82	2.03
56	1.98	2.33
58	2.31	2.75
60	2.84	3.29

(k) French assured lives (J. I. A., XXXIII., 485).—A short time ago four chief life insurance companies in France combined in compiling their mortuary experience. The experience was taken out in respect to assured lives and annuitants. The result so far as assured lives were concerned show (1) that the mortality, especially at the younger ages, is appreciably higher than that of English female assured lives, and (2) that for whole life insurance the premiums are actually less when compared with premiums for French male assured lives. This, however, does not infer that for all ages the expectation of life of the female exceeds the male. The fact is (1) that French female lives have a less expectation of life than French male assured lives up to age 30, (2) beyond that age the female life has an increased expectation of life. The following table gives the exact figures for quinquennial ages 20 to 80, inclusive:

EXPECTATION OF LIFE OF FRENCH ASSURED LIVES.

AGE.	MALE.	FEMALE.
20	42.06	40.82
25	38.41	37.41
30	34.68	34.50
35	31.02	31.45
40	27.40	28.25
45	23.79	24.99

AGE.	MALE.	FEMALE.
50	20.31	21.62
55	16.96	18.19
60	13.83	14.85
65	11.01	11.77
70	8.50	9.08
75	6.38	6.93
80	4.72	5.45

Mr. Masse (J. I. A., XXIX., 71), a French writer, points out, (1) that among the great body of British assured lives, according to the British Institute of Actuaries' experience, a greater mortality exists among females than among males. (2) That the same feature is observed in the German experience, and in the experience of the 30 American offices. (3) That these facts show (a) that up to the age 45 the mortality of males is lower than that of females, and (b) after 45 years of age the reverse is the case. He states that the main causes of the extreme mortality among females under 45 is due to the risks and diseases peculiar to females—phthisis, anemia, etc. The American statistics (30 American offices) indicate other diseases. The same writer states that German companies add three years to the age of female lives insuring before age 45 and remove the extra after that age.

(1) The following table applies to the expectation of life of the population of Victoria, N. S. W., which is somewhat remarkable in that it indicates for each year of age a considerably increased expectation of life for the female when compared with the male*:

AGE.	MALE.	FEMALE.
15	45.21	47.46
20	41.05	43.31
25	37.20	39.46
30	33.49	35.81
35	29.80	32.21
40	26.21	28.70
45	22.74	25.24
50	19.43	21.80
55	16.33	18.39
60	13.44	15.12

**Am. Ex. and Rev.*, 1894.

I think the general opinion to be obtained from these various experiences is that female assured life below age 45 is not so favorable as male life, but that after the latter age it is more favorable, and probably that female vitality considered for all periods of life is greater than male vitality. The late Cornelius Walford (J. I. A., XIX., 174), a British actuary of note, made a very exhaustive examination some years ago of the experiences deduced from time to time in respect to female mortality, and concluded that female lives were not inherently bad, but that on the whole they were better than male lives. He admitted, however, that assured female lives were inferior to male assured lives, and gave as the reason that not only could this be attributed to insufficient medical examination, but that selection against the office, partly intentional (and perhaps partly involuntary), certainly often involuntary, so far as the lives themselves are concerned, was the real solution. He stated that the main causes are to be traced to the circumstances which gave rise to the insurance of female lives; for instance, under marriage settlements, where the mother frequently has a life interest in the funds settled and on her death it passes to her children—if the wife shows any signs of delicate health insurance is secured, otherwise no insurance is contemplated.

It has sometimes been stated that the risks of childbirth furnish the solution of the extra mortality of assured female lives, and in this connection it might be interesting to note what is the effect of marriage on female life, both during the period of childbirth and after that period has passed.

The annual report of the Registrar of Scotland (J. I. A., XXII., 233) enables us to determine this. Arranging the female lives into two groups, (1) females at the ages when they are capable of bearing children, and (2) females past the child-bearing age, viz., 45 to the close of life, it is observed that the high mortality of females is limited to the child-bearing age, 15 to 45, whereas above that age the married female dies at a considerably lower rate than the unmarried

female. Comparing the mortality of married and unmarried females at every quinquennial period of life, the high death-rate of married females appears to be confined to the ages under 30; from 30 to 35 and from 35 to 40 the death ratio of the married females falls below that of the unmarried. It has also been proven that the excess of mortality in the married female as compared with the unmarried at the same age, is almost solely due to the superadded dangers attending the birth of the first child. The married female even during the rest of her child-bearing life has an equal chance of life with the unmarried and has a better chance of life than the unmarried after she has passed her 30th year. It is found that the married female dies at a higher ratio during the three quinquennial periods of life, 15 to 30 years, but during the latter portion of her child-bearing life, when the half of her children are born, viz., 30 to 40 years of age, the married died at a lower rate than the unmarried. At the age when the usual "change of life" occurs, viz., 40 and 45 years, the mortality of the married female again slightly exceeds that of the unmarried, a result which might have been expected, seeing that the fatigues of childbirth and the hard labor connected with the nursing and rearing of a family somewhat weakens the system and renders the crucial period of life somewhat more trying to the married than to the unmarried woman. From that period on to old age, viz., 75 years, the married and widowed die in smaller proportion than the unmarried. The higher death-rate suffered by the married females from 15 to 30 years of age is, in all probability, caused by the greater danger to life which in a civilized state attends the bearing of a first child. Every medical man knows that the risk to a mother is far greater at the birth of her first child than at any subsequent delivery, and that the danger is greater just in proportion to her delicate uprearing. The following table will render these views almost a certainty. It shows the number of mothers at each quinquennial period of life who gave birth to children in Scotland in 1855 and the number and

proportion of those at each age who gave birth to their first child:

Ages of mothers.	Total number of mothers.	Number bearing first child.	Per cent. bearing first child.
15-20	2,589	1,424	55.00
20-25	19,230	7,650	39.78
25-30	25,679	4,448	17.32
30-35	21,317	1,502	7.04
35-40	15,070	544	3.61
40 and above	7,153	54	.75
All ages,	91,038	15,622	

From this it appears that it was only at the ages when a very high proportion of the married women were giving birth to their first child that their death-rate rose higher than that of the unmarried, but the moment that age was attained when the great majority of married women had got over the birth of the first child, viz., about 30 years of age, the mortality of the married women fell below that of the unmarried.

Mr. Messent (J. I. A., XIX., 206), a British actuary, stated that if the registers of lying-in institutions of Great Britain were examined and also the works of medical men who had devoted attention to the subject, it would be found that the risk of child-bearing is much overrated, while in insured lives the fact is that the mortality among females is not so high as among males, but that the defect in the female life exists partly in the causes which produce the insurance and partly in the way in which the medical examinations are made. He suggested that no examination be made of a female unless the person examined be accompanied by another female; the medical men are unable to ask a female when alone questions which they would be able to ask a male candidate. Mr. Smee (J. I. A., XIX., 203), also a British actuary, after making an examination embracing 16,000 cases of midwifery, stated that the mortality of females is higher in the first birth and gradually diminishes until the fourth birth. It is believed that death frequently occurs from consumption,

which no amount of medical examination could reveal; in some cases there is no trace of consumption before the birth of the child, and yet within two months thereafter the woman dies from the disease. The cause of mortality among women who have no children, to a larger extent than among those who have children, is "cancer uteri," which not infrequently happens about the age of 42. Mr. Hart, of the Scottish Equitable Society, after making an examination of the mortality of married females of the peerage, intimated that he believed that insurance on the female life should be considered with regard to the time she had been married, and that it would be advisable in the case of an unmarried woman to stipulate for an extra premium on marriage. This however would hardly be practicable. The heaviest mortality was found to exist in the second year after marriage, but some statistics showed that this occurred in the first year after marriage.

Some time ago I wrote to the life insurance companies of the United States and Canada asking them what was their practice in respect to the insuring of female risks, and I beg now to thank the medical directors of these companies, personally, for their kindness in promptly replying and for giving me the information desired. It will be interesting and profitable to record briefly the methods which life insurance companies employ in dealing with this class, but before doing so I think it important to preface these rules by an extract from a communication of Mr. Benjamin F. Stevens, President of the New England Mutual Life, published in *Mortality Experience on Female Risks*, compiled by that company:

"Experience shows that insurance upon lives, whether male or female, in which no pecuniary interest appears to exist on the part of those who are to be benefited, is in general a loss for the company, being speculative in character and therefore more hazardous than ordinary risks in which an interest really exists. Thus, a widow left with a family depending upon her exertions for support is a case clearly insurable, and, it is believed, never objected

to. Or a woman persecuted with an idle or dissolute husband may in certain places contract debts and enter into trade upon her own account for the support of her family. But the relationship alone does not create a pecuniary or insurable interest. In general terms, therefore, no policy will be issued by this company upon the life of any person, male or female, unless there is manifestly an insurable interest on the part of the beneficiary. As at present advised, the insurable interest must, in the case of a woman, be founded upon an income depending upon her life, which may come in either of two ways: (1) by property left in trust for her benefit, the income of which expires or reverts to parties outside of her immediate family at her decease, in which her husband and children are pecuniarily interested; (2) by her own exertions in the support of her family, induced thereto by circumstances before mentioned.

"Where such insurable interest clearly exists no one can be benefited by the death of the assured beyond the amount of that interest, and therefore there is no inducement to fraud. If the insurable interest is ignored and policies made haphazard, the beneficiary has an interest in the death of the assured, and not in the life, thus offering a direct incentive to crime. The company takes the ground that insurance in any form is indemnity for loss, and there can be no loss where no interest exists. Fraud is more easily perpetrated in the case of women than in men, because of the peculiarity of many complaints with which they are affected, and when concealment of the fact is so possible it is in itself an inducement for unscrupulous persons to obtain insurance."

I also think it important to quote the following in respect to insurable interest, contained in a circular letter of Joseph A. Deboer, Secretary of the National Life Insurance Company, which will elucidate the question of insurable interest which plays such an important part in the treatment of female risks.

"An insurable interest may exist in applicants of both

sexes, whether single or married, and of whatever age. In the young, and in women as a class, it is not so great as in men and, for that reason, requires a statement of facts to make it clear. Financial irresponsibility and dependence have been safely regarded as implying moral hazard in the insurance of life. Because these things more truly describe all women than all men, the fact of an insurable value or interest must be looked at carefully, when women apply.

"All which it seems necessary to show in order to take the case out of the objection of being a wager policy is, that the assured has some interest in the life of the *cestui que vie* ('beneficiary'); that his temporal affairs, his just hopes and well grounded expectations of support, of patronage and advantage in life, will be impaired; so that the real purpose is not a wager, but to secure such advantages supposed to depend on the life of another."—SHAW, C. J.

"It is not very easy to define with precision what will in all cases constitute an insurable interest, so as to take the contract out of the class of wager policies. It may be stated generally, however, to be such an interest, arising from the relations of the party obtaining the insurance, either as creditor of or surety for the assured, or from ties of blood, or marriage to him, as will justify a reasonable expectation of advantage or benefit from the continuance of his life."—FIELD, C. J.

Following these definitions, it is reasonable to conclude that blood relationship, or that of marriage, presupposes an insurable interest in law; but for life insurance purposes the test of this interest is a money valuation. If the latter is wanting, insurance will be speculative.

The Aetna Life Insurance Company, Hartford, Conn.—Up to the age of 55, \$5.00 extra per \$1000 is charged. No extra charge if insurance is on endowment plan for 20 years or a less number of years. If the husband is insurable it is essential that his life also be insured. Especial care exercised in the admission of females.

Berkshire Life, Pittsfield, Mass.—Before receiving applications on the life of females, advance information required, embracing among other things the following: Name, residence, occupation, particulars of date and place of birth, race, height, weight, insurance at present carried by applicant, married, single, or widow, husband's name and occupation, number of children applicant has had, their names, ages, and number now living; amount and character of insurance desired; if declined by any company, the date and name of the company; proposed beneficiary; name of person who is to pay the premium; what property applicant has in her own right, and estimated value.

Brooklyn Life Insurance Company, New York City.—An extra premium was formerly charged; now females taken at same rates as males, but for limited amounts; essential that proper insurable interest exists; as a rule, policy will not be granted where the beneficiary is the husband.

Connecticut General Life Insurance Company, Hartford, Conn.—Abandoned the practice some years since of charging an extra premium; accepts females at same premium rates as males; insurable interest essential.

Equitable Life Assurance Society, New York City.—Charges same rates for females as for males; insurable interest essential. Females placed in a class by themselves in order to demonstrate by actual experience whether the old charge of \$5.00 extra per \$1000 is justifiable or not.

Germania Life Insurance Company, New York City.—Females accepted at the same rates as males. Essential that husband shall also carry insurance. There must be a record as to parturition. Policies will not be granted in favor of husband. Especial attention is paid to normality of sexual functions.

Home Life Insurance Company, New York City.—Single women, or married women having given normal birth to a child, charged an extra premium of \$5.00 per \$1000, except on the 10-, 15-, or 20-year endowment plans. After

climacteric period is passed the extra premium is waived. Insurable interest essential. Husbands cannot be made beneficiaries. Applications will not be accepted from an applicant while she is pregnant or until three months have elapsed after the normal birth of the child.

Life Insurance Company of Virginia, Richmond, Va.—Amount of insurance limited. If married and husband alive and insurable, he must be insured in some company for an equal amount of insurance as that applied for. Beneficiary assumed to have insurable interest. No extra charge where 20-year endowment plan is selected, or plan involving a higher premium than called for by that policy. On other plans an extra premium of \$5.00 per \$1000 is charged, ceasing after the age of 48. Women are not insured while pregnant nor until 60 days after confinement.

John Hancock Mutual Life Insurance Company, Boston, Mass.—Accepts female risks without any restrictions.

State Mutual Life Insurance Company, Worcester, Mass.—Females accepted on same terms as males for limited amounts. Young married women or young unmarried women who have never borne children not considered desirable.

Mutual Life Insurance Company of New York.—Female risks accepted on the same terms as male risks.

Mutual Benefit Life Insurance Company, Newark, N. J.—Declines to insure female applicants.

Michigan Mutual Life Insurance Company, Detroit, Mich.—Declines to insure female risks.

Metropolitan Life Insurance Company, New York.—Females accepted on the same terms as males, on 10-payment life plan and 10-, 15-, or 20-year endowment plans. An extra premium of \$5.00 per \$1000 is charged on the ordinary life and 20-payment life plans, until the age of 49 has been attained. Essential that the purpose of insurance be clearly shown, and that the moral hazard is without question. The amount of insurance granted on individual lives depends upon circumstances.

Massachusetts Mutual Life Insurance Company, Springfield, Mass.—Females insured on the same plans and at the

same rates as for males; great care exercised to see that the beneficiary has an insurable interest in the life insured. Seldom grants policies on the life of married women more or less dependent on their husbands for support.

Manhattan Life Insurance Company, New York.—Declines to insure females where there is no definite insurable interest involved; where husband is beneficiary application not accepted, except where he is dependent on the continuance of the wife's life for support, or would be deprived of her property at her death. Those who have passed the climacteric are accepted at the same rates as male applicants, except on certain low-premium forms of insurance. An excessive mortality arising from the insuring of females is made a charge against dividends under the policy. Married women who have not passed the climacteric and have had a child or children will be granted 20-year endowment insurance without extra, or on other plans involving a lower rate with an extra charge of \$5.00 per \$1000. Married women who have had no children and unmarried women are accepted on the 20-year endowment plan with an extra premium of \$5.00 per \$1000, or on plans involving a lower rate with an extra premium of \$10.00 per \$1000. The amount of the insurance is limited and the applicant must be not less than 18 or more than 60.

Northwestern Mutual Life Insurance Company, Milwaukee, Wis.—Declines to insure female risks.

New York Life Insurance Company.—Accepts female applicants at the same rates as male applicants, provided the beneficiary has a clear insurable interest in the life insured.

National Life Insurance Company, Montpelier.—Accepts females on the same plans and at the same rates as males, with certain exceptions: (1) women under 20 years of age; (2) women in pregnancy; (3) women in lactation; married women until after the birth of the first child or until five years after marriage, are not eligible. The following cases will be considered doubtful and invariably require explanation: (1) women applying for the benefit of their husbands. (2) women applying for the benefit of strangers. (3) women

who are not self-supporting or in receipt of an income. (4) women over 45 and who have not passed the period of menopause.

Prudential Insurance Company, Newark.—An extra premium (not stated) charged upon unmarried females, unless they apply for endowment insurance, in which event no extra is charged. This extra is not imposed upon married women provided their husbands apply at the same time for insurance; on all other cases the extra premium is charged.

Provident Savings Life Insurance Society, New York City.—Females accepted at the regular rates of premiums for certain limited-payment life policies, endowment policies, and, in exceptional cases, whole life policies. Where the life proposed for insurance is over 50 the life will be accepted on the 20-year renewable term plan. The amount of insurance is limited. It is essential that the beneficiary shall have an insurable interest in the life proposed for insurance. The society will not consider applications for insurance from domestics, ordinary laborers, or ignorant or illiterate females, or cases in the rural districts. Special questions are proposed covering among other things the following: Has the woman property in her own right which is her source of income? Will she pay the premium herself? Is the amount proportionate to her means? If married, husband's name, occupation, and address must be given. Is the husband insured? If so, for whose benefit? The motive for the insurance and full details of interest of beneficiary in the applicant's life.

Phoenix Mutual Life, Hartford, Conn.—Accepts females at the same rates as males. The company exercises somewhat more thorough discrimination, and declines to insure during pregnancy and lactation.

Penn Mutual Life Insurance Company, Philadelphia, Pa.—Married women over 30 who have not given birth to a child will not be accepted till the expiration of five years from the date of marriage. Between ages of 20 and 30 only two years will require to elapse. Under the age of 20 each case will be considered on its own merits. Two months must elapse after the birth of a child before application will be

considered. Applications on the lives of women under 18 will not be accepted.

Provident Life and Trust, Philadelphia, Pa.—Women accepted at the same rates as men. Great care exercised in selection. Will not accept during pregnancy, or until reasonable time after childbirth. Record as to menstrual and maternal functions must be clear.

Travelers' Insurance Company, Hartford, Conn.—An extra premium of \$5.00 is charged up to age 48 on the ordinary life, limited-payment life, and endowment plans of longer term than 20 years; no extra is charged on the 10-, 15-, and 20-year endowment plans.

United States Life Insurance Company, New York City.—Females are accepted on all plans and at the same rate as males, excepting on the term plan, under which an extra premium of \$5.00 per \$1000 is charged up to age 48. Insurance on the lives of married women will not be granted except in favor of their children, unless the husband or other proposed beneficiary has a direct financial interest in the life of the applicant. Special enquiry made as to the surroundings, associates, and moral condition generally.

Union Mutual Life Insurance Company, Portland, Me.—Females accepted on the same plans and at the same rates as males for limited amounts, excepting female factory employees, to whom will be granted only 15-year endowment policies.

Union Central Life Insurance Company, Cincinnati, O.—Females accepted on all participating plans at the same rates as men. Amount of insurance limited. Rules more strict with females than with males.

Washington Life Insurance Company New York.—Requires all female applicants to be examined by women physicians where possible. Women physicians have been appointed at all points in the United States in which they can be found. Essential that beneficiary shall have insurable interest. Investigation being made by the company in respect to female risks insured by it. Settled policy not yet decided upon.

Canada Life Assurance Company, Hamilton.—Does not accept applications on the lives of females.

Confederation Life Association, Toronto.—Accepts females with an extra charge of \$5.00 per \$1000 up to 50 years of age, except on short endowments and 10-payment life plans.

Dominion Life Insurance Company, Toronto.—Females accepted on all plans after age 50 has been attained; previous to that age will accept on all plans except ordinary life.

Federal Life Assurance Company, Hamilton.—Accepts females at same rates as males on the 20-payment life plan and on all other plans involving a higher premium rate per \$1000. On plans involving a lower premium rate than 20-payment life plan an extra premium of \$5.00 per \$1000 is charged.

Great West Life Assurance Company, Winnipeg.—Women are insured on ordinary rates where the beneficiary has a direct insurable interest in the life insured and where they have an income of their own. Those who desire insurance as a means of investment are taken on the endowment plan (presumably at ordinary rates). Husbands will not be made beneficiaries.

London Life Assurance Company, London, Ont.—Females are charged an extra premium of \$1.00 to \$3.00 per \$1000 according to the plan of insurance, the lesser extra premium applying to short-term endowments and the greater to long-term endowments.

Manufacturers' Life Assurance Company, Toronto.—If unmarried, or married and after the birth of the first child, an extra premium of \$5.00 is charged on the ordinary life plan; no extra is charged on limited-payment life and endowment plans. Married and before the birth of one child an extra premium of \$10.00 per \$1000 is charged on ordinary life plan and \$5.00 per \$1000 on limited-payment life and endowment plans. After the age of 48 no extra premium is charged. The amount of insurance is limited where the age is under 48, and no females will be accepted on the term plan.

Ontario Mutual Life Assurance Company, Waterloo.—

Accepts women from ages 20 to 50 on 10-, 15-, and 20-payment life plans and on any form of endowment not exceeding 25 years' duration; after the attainment of age 50 will accept on any plans at ordinary rates.

Royal Victoria Life Assurance Company, Montreal—Females accepted on all the ordinary plans without an extra premium excepting on the without-profit plans and on term insurance. The amount of the insurance is limited and the beneficiary must be a child of the insured. In cases of unmarried women, each case would be rigidly scrutinized before acceptance.

Sun Life Insurance Company, Montreal.—An extra premium of \$5.00 is charged on female lives under the age of 50; exceptions occasionally made on endowment policies on widows and married women where the insurance is taken out chiefly for the investment of money.

Standard Life Insurance Company, Canadian office, Montreal.—Discourages agents from canvassing for female risks. When applications are received, however, the risks are accepted at the same rates as male risks. No extra is charged in the case of married women if one child has been born. If applicant has been recently married, an extra of \$10.00 per \$1000 is made until the first child is born. If there are no children the same extra is charged up to four or five years after marriage.

The Scottish Life Insurance Companies' (J. I. A., XIX., 209) associated some time ago and determined after very careful consideration to charge an extra premium of 5 shillings per cent. per annum on the sum assured, that is, \$2.50 per \$1000, until age 50 was attained; after that age the extra was discontinued. If the applicant be pregnant for the first time it was thought that circumstances might exist, not discoverable to the company's medical examiner, involving an unusual risk in the confinement, which may have led to proposal for insurance being made; an additional \$5.00 per \$1000 for the first year was suggested.

British and Irish Life Insurance Companies (J. I. A., XXIX., 75).—Some years ago a circular letter was addressed

to all the British and Irish life insurance companies in respect to their practice and answers were asked to certain questions. The following is a synopsis of the answers:

Question (a). The additional premium, if any, charged for unmarried women.

One company accepts no females.

Forty-six companies charge no extra, but two require payment of \$10.00 per \$1000 on marriage, and one an extra premium of \$5.00 on first confinement

Twenty-two companies charge an extra of \$2.50 per \$1000.

Fifteen discontinue the charge at age 50, one at 45, six continue for all time.

Two companies make an addition of 10 per cent. to the premium for all time.

Six companies charge single premiums (five of \$10.00 per \$1000, one of \$5.00 to \$10.00 per \$1000).

One company uses special table.

Question (b). Married women who have borne no children.

One company does not accept females.

Forty-one companies charge no extra. (One an extra of \$2.50 if under 30; one an extra of \$5.00 at first pregnancy; one an extra of \$10.00 if in first married year.)

Twenty-one companies charge \$2.50 per \$1000 extra, fifteen discontinue charge at age 50, six continue to charge.

Two companies charge 10 per cent. extra; one company uses special table.

Question (c). Married women who have borne children.

One company does not accept females.

Fifty-two companies charge no extra. (One charges \$2.50 per \$1000 if under 30.)

Twenty-one companies charge an extra of \$2.50 per \$1000, fifteen discontinue charge at 50, and six continue to charge extra premium.

Two companies charge 10 per cent. additional to premium; one company charges single extra premium of 10 per cent.; one uses special table.

Question (d). Married women who are pregnant first time.

In many cases application is postponed and in others

extra single premiums ranging from \$5.00 to \$30.00 per \$1000 are charged.

After very carefully considering the subject of insuring females, I think that all experience obtained and information gathered would indicate (1) that up to age 48 the female risk is not so good as the male risk; (2) that after the age of 48 the female risk is better than the male risk; (3) that the greatest danger in married females is in connection with the birth of the first child; (4) that the moral hazard is probably the most important factor in the question; (5) that females are more apt to conceal important facts than male applicants are; (6) that it is impossible to secure as complete an examination of the female as of the male.

I beg to offer the following suggestions for your consideration in respect to the insuring of female risks:

(1) **MARRIED WOMEN.**

(a) A woman who is pregnant is uninsurable until three months have elapsed since successful delivery; also married women until after the birth of their first child, or until five years after marriage.

(b) The beneficiary must have a good and clear insurable interest in the life proposed for insurance, and the object for which the insurance is sought must be satisfactorily and definitely set forth. If the person applying for insurance has a family, the beneficiary or beneficiaries must be her child or children. Under no circumstances will a policy be issued in favor of a husband, unless it can be unmistakably shown that he is dependent upon his wife for support, or that in the event of her death he will suffer financial loss, either of property or support.

(c) The husband, if alive and insurable, must be insured in some company for at least as large an amount as the proposed policy on the life of his wife.

(2) **UNMARRIED WOMEN.**

(a) The beneficiary must have a good and clear insurable interest in the life proposed for insurance, and the object for which the insurance is sought must be satisfactorily and definitely set forth.

(b) Unmarried women, unless money producers, are not deemed desirable risks from a moral standpoint.

(3) GENERAL.

(a) Policies should not be granted to married or unmarried women on any of the without-profit systems of insurance, except on 10-, 15-, or 20-year endowment plan, nor on any term plan of insurance.

(b) The company's risk on any single female life should be limited—perhaps not more than one third of the full amount should be undertaken.

(c) In every case of a female applying for insurance, a special form should be completed and sent to the head office with the application and medical examiner's report.

(d) In the event of an agent having doubt as to whether an applicant will be accepted by the company, on account of the moral hazard, he is requested to complete the special form and transmit it to the head office for consideration. If satisfactory, the office will advise him to have the medical examination proceeded with.

(e) The medical examiners should be specially instructed to exercise the greatest precaution and make a thorough examination of the applicant, endeavoring to elicit any peculiar circumstances which may be connected with the moral hazard of which the company should be informed.

SPECIAL FORM.

1. Applicant's name.
2. Residence.
3. Occupation.
4. Place of birth.
5. Date of birth.
6. Married, single, or widowed.
7. If married, husband's name.
8. His occupation.
9. Number of children had.
10. Number now living.
11. Their ages and sex.
12. Their occupations.
13. Name of beneficiary.
14. Relationship.

15. Motive for insuring.
16. Whether beneficiary is dependent upon applicant.
17. If so, give full particulars.
18. Name and particulars of person to pay premium.
19. State source of income.
20. Amount of insurance.
21. Style of insurance.

The above questions should be answered and submitted to the office before any further action is taken.

An animated discussion followed, participated in by Drs. Fisher, Homans, Storrs, Tabb, Tuck, Wells and White. On motion (Dr. Holden) the thanks of the Association were extended to Dr. Thorburn.

On motion (Dr. Tuck) it was resolved that the thanks of the Association be extended to the Sun Life Assurance Company, the Mount Royal Park Incline Company and the St. James Club for hospitalities extended to the Association.

The thanks of the Association were extended to Dr. Wilkins for his many courtesies.

The subject recommended by the Executive Committee for general discussion was then taken up, "Sugar in the Urine," and participated in by Drs. Burrage, Davis, Devendorf, Emery, Grant, Holden, Homans, Northcott, Shepherd, Storrs, Tabb, Tuck, Wells, White, Wilkins, Wolverton and Wood.

It was moved and seconded that the Executive Committee select a topic for discussion at the next annual meeting and designate some member to write a paper thereon and appoint four members to discuss it. Carried.

Dinner took place in the evening at the Windsor Hotel, at which the speakers were Drs. Tabb, Holden, F. Wells and Devendorf.

TENTH ANNUAL MEETING.

The Tenth Annual Meeting of the Association was held at the offices of the Mutual Life Insurance Company, 32 Nassau Street, New York, on May 31st and June 1st, 1899. There were present at some time during the meeting Drs. Brannan, Bross, Burrage, Campbell, Chapin (Frank W.), Chatard, Curtis, Devendorf, Emery, Fisher, Grant, Hamill, Homans 2d, Huntington, King, Lambert, Marsh, Morgan, Munn, Natress, Northcott, Paddock, Rex, Rogers, Root, Shepherd, Storrs, Strathy, Symonds, Tabb, Thorburn, Vander Poel, Vanderwater, Van Wagenen, Webb, Wells (F.), Wells (G. W.), White, Wilkins, Willard, Woolverton, Wood and Young: 43 members.

President Tabb took the Chair and at 11.15 called the meeting to order.

The minutes of the last annual meeting and of the meetings of the Executive Committee were read and approved.

The following were duly elected members of the Association:

Dr. Brandreth Symonds, Mutual Life Insurance Company.

Dr. James T. Hutchinson, Penn Mutual.

Dr. William H. Wehner, Penn Mutual.

Dr. William Perry Watson, Prudential Life Insurance Co.

Dr. Thomas W. Bickerton, New York Life Insurance Co.

Dr. William Natress, Temperance and General.

Dr. Tabb then read his annual address giving a historical review of the Association.

Tenth Annual Meeting.

On motion, duly seconded, the President appointed Drs. Storrs, Wells (F.) and Emery a Committee to nominate officers for the ensuing year.

The following expression of the wishes of the Association was referred to the Executive Committee: "That one month prior to each annual meeting, the Secretary shall send a notice to each member stating the place, date and hour of meeting, together with the program of business to come before the meeting so far as known at that date."

Notice was given of the following Amendment to Article 8 of the Constitution: "To alter the last sentence of Article 8, making it read, 'the President and Vice-President shall not be eligible for re-election.'"

The Secretary read a letter from Dr. T. Glover Lyon regretting his inability to be present at the meeting. He was instructed to express to Dr. Lyon the regrets of the Association.

The Secretary was instructed to prepare for printing the minutes and transactions of the Association from its foundation up to and inclusive of the present annual meeting.

The Nominating Committee reported that it recommended for election:

For President, Dr. H. Cabell Tabb; 1st Vice-President, Dr. George R. Shepherd; 2d Vice-President, Dr. J. H. Webb; Secretary, Dr. Oscar H. Rogers; Treasurer, Dr. Frank S. Grant; Executive Committee, Dr. Edward Curtis, Dr. Granville M. White, Dr. A. Huntington, Dr. Albert Wood.

The meeting adjourned at 4.45 P.M. to meet at 10.30 the following morning.

SECOND DAY'S MEETING.

The meeting was called to order by President Tabb.

Dr. Tabb announced his unwillingness to accept a nomination for a third term. After an animated discussion, in which Dr. Hamill nominated Dr. Shepherd, it was moved to proceed to the election. The President appointed Drs. Hamill and Fisher tellers. A ballot being taken, Dr. Shepherd received 17 votes and Dr. Webb 1.

Dr. Hamill having been nominated for 1st Vice-President, the Secretary was instructed to cast the vote of the Association for Dr. Hamill.

Dr. Webb having refused a re-election as 2d Vice-President, on motion the Secretary was instructed to cast the ballot of the Association in favor of Dr. King, who was declared elected. The other officers were elected in a similar manner. The result was as follows:

PRESIDENT.

DR. GEORGE R. SHEPHERD.

VICE-PRESIDENT.

DR. EDWARD H. HAMILL.

2D VICE-PRESIDENT.

DR. MORRIS LEE KING.

SECRETARY.

TREASURER.

DR. OSCAR H. ROGERS. DR. FRANK S. GRANT

EXECUTIVE COMMITTEE.

DR. EDWARD CURTIS.

DR. A. HUNTINGTON.

DR. ALBERT WOOD.

DR. GRANVILLE M. WHITE.

The scientific work of the Association was then taken up.

Dr. Northcott expressed his regret that he had been unable to prepare a paper for the meeting, as he had been requested to do by the President.

Drs. Willard and Wilkins also expressed their regrets at not being able to prepare papers.

Dr. Marsh called the attention of the Association to the importance of the adoption of a uniform system of classification of causes of death.

Dr. Root then read a paper on

THE DIFFERENTIAL DIAGNOSIS OF CARDIO-VESICULAR MURMURS.*

By cardio-vesicular murmurs, I mean a certain form of functional heart-murmurs of a variety frequently met with, as I believe, by life insurance examiners, but more often overlooked or misinterpreted by physicians examining patients ill with some disease.

This is a systolic apex murmur heard with most intensity at or in the immediate vicinity of the apex, heard somewhat along the cardiac border, heard less frequently at the base, and still more rarely heard behind. Its character varies from that of a soft, breezy, blowing murmur to one closely simulating a well-defined friction sound, but is peculiar from the fact that it is altered in intensity by inspiration or expiration; that it may be completely obliterated by either forced inspiration or expiration, or by suspending respiration entirely

* Reprinted from the *Proceedings of the Connecticut Medical Society*.

for the moment. It is completely synchronous with the contraction of the heart and not with the respiratory act. It is not heard during the cardiac diastole. This murmur is sometimes heard with greatest intensity in the recumbent position, and disappears on standing. Others are only heard standing or leaning forward, and disappear in the prone position. The size and position of the heart is normal in all cases of uncomplicated murmur of the variety of which I am speaking.

The cause of this abnormal heart-sound is not clear. None of the authorities do more than refer somewhat casually to accidental murmurs, as they call them, and only one or two authors that I have been able to find mention definitely the heart-murmur corresponding to the variety I am discussing and consider its causation.

In the *British Medical Journal* for November 29, 1890, is an article by Dr. J. S. Bristowe, F.R.S., senior physician to St. Thomas' Hospital, discussing this and other abnormal heart-sounds in which this occurs: "It is well known, or at any rate largely believed, that some murmurs generally termed cardiac are of no cardiac significance. So-called hemic murmurs are common at the base of the heart. Of these I do not propose to speak. But at the apex it is not unusual to hear systolic murmurs, which there is also just reason to believe are not organic. The murmurs to which I here refer correspond to ordinary mitral systolic murmurs in the fact that they are best heard at the extreme apex of the heart, but they differ from them in the fact that they occupy a much restricted area, that they are not conducted into the axilla or the back, that they are considerably modified by the acts of respiration, and that there is no necessary evidence of enlargement or dilatation of the heart or accentuation of the second sound in the pulmonic area. I believe them to be caused in the same way that the 'Bruit de pot fêlé' is caused, only the contraction of the lung to which they are due is affected by the impulse of the apex-beat and not by the fingers of the physician. Such murmurs are largely influenced by respiration and not uncommonly by the pressure of the stethoscope. As to their relation to the respiratory acts I

believe they are generally intensified during expiration and inspiration, and especially during the latter, and that they often disappear absolutely at the end of expiration, and that, other things being equal, they are usually increased by a firm pressure of the stethoscope.

"I may, in confirmation of the view that these murmurs are due to the cause above specified, say that I have occasionally noticed in cases in which the breath is wavy over the upper part of the left lung, that during inspiration the wavy character along the edge of the heart has been replaced by an obvious though slight murmur resembling the murmur more frequently and better heard at the end of the apex. The last phenomenon is the production of a definite murmur by the actual squeezing of the air out of a limited portion of lung by the impulse of the heart against it. This, as I have remarked, may be occasionally feebly heard along the edges of the precordial area of dulness, replacing mainly during inspiration the simple rhythmical sound of the respiratory act, but it is always best heard at or near the apex of the heart, simulating the cardiac systolic murmur. The main factor is the sudden compression of the lung tissue by a blow suddenly inflicted upon it, and the production thereby of a murmur due to the escape of air from the tissues into and along the bronchial tube."

Sansom in his *Diagnosis of Diseases of the Heart and Thoracic Aorta*, page 318, states that in differentiating a murmur in the mitral area due to an extra-cardiac from that due to an intra-cardiac cause, "In the sound as of a murmur due to the impact of the apex of the heart against the alveoli of the lung, the difficulties of differentiation may be much greater. Such murmurs are to be heard just over the heart's apex, not conducted in the paths of an intra-cardiac mitral murmur, but as the latter may be also thus localized, we must consider their other characters. They are much influenced by the respiratory movements, easily intensified both during expiration and inspiration, especially during the latter, and they often disappear at the end of an expiration. If, therefore, a rhythmical crescendo or diminuendo is observed

during the respiratory acts, it is very probable that the murmur is not due to organic valvular causes. The cause of the sound is the pressure of the ventricle during its systole upon the neighboring alveoli of the lung, whereby the air is squeezed out of them, and thus, as it were, an audible puff is produced."

I have had occasion in corresponding with our examiners in various parts of the country, relative to life insurance risks, to bring this question up, and it would be interesting if space permitted to quote the various opinions of some of the ablest diagnosticians in the country regarding these anomalous sounds. They are far more common than one would suspect, considering how little literature there is about them. And their importance is considerable when one reflects how often and how easily they may be mistaken for organic valvular murmurs, and a bad prognosis given accordingly.

In considering the differential diagnosis of these murmurs we will confine ourselves entirely to a systolic apex-murmur, as these sounds are seldom heard at the base, and so rarely heard behind as to practically leave them out of consideration. They are liable to be mistaken then,

First, for a mitral regurgitant murmur, due to insufficiency of the mitral valves;

Second, for tricuspid insufficiency;

Third, for pericardial or pleurocardial friction sounds;

Fourth, for true hemic murmurs due to chlorosis, anemia, etc.

A study of the point of greatest intensity of the murmur, the paths of conduction of the sound, and the condition of the right auricle should throw out a tricuspid lesion. Moreover, a lesion of this valve sufficient to cause a murmur that has existed any time, will be followed by a compensatory hypertrophy of the right ventricle with its resulting change in the area of cardiac dulness and lifting of the apex. In mitral lesion it may be questioned whether a permanent mitral lesion, due to insufficiency of the valve, can ever occur that is not followed by hypertrophy of the ventricle or dilatation of the left chamber of the heart. It is true that in certain forms of

blood diseases, and in certain nervous conditions, many observers believe that owing to unequal tension of the papillary muscles of the chordæ tendineæ an actual insufficiency or leakage of the valve may occur without pre-existing endocarditis or permanent structural alterations of the valve itself. Be that as it may, it is but a temporary condition, and is never followed by either dilatation or hypertrophy of the left ventricle, which condition does invariably follow actual permanent structural defects of the valve.

The murmur of mitral regurgitation is heard throughout the cardiac systole; neither its intensity nor its tone-quality is influenced by expiration or inspiration. A cardio-vesicular murmur is likewise heard during the cardiac systole, but its intensity rises and falls or disappears entirely during inspiration and expiration. A mitral murmur cannot be extinguished by requesting the patient to hold his breath, while the cardio-vesicular murmur can be completely obliterated by holding the chest either in a position of forced inspiration, forced expiration or simply arresting respiration. If a true mitral lesion exists, careful percussion of all the cardiac area and search for the point of impact of the apex against the chest-wall will show a greater or less degree of enlargement of the heart, with the apex pushed to the left and downward. Moreover, in actual mitral lesion accentuation of the second sound of the heart over the pulmonic area is the rule. From anemia, chlorosis and other conditions dependent upon changes in the blood, the objective symptoms of anemia are usually sufficient easily to decide the question; if not, the examination of the blood and the count of the corpuscles should settle the question.

From pericarditis, from pleuritis resulting in actual friction sounds due to a roughened condition of the pleura or pericardium, the differentiation is difficult, for the murmur may assume the crescendo or diminuendo character during inspiration and expiration of the cardio-vesicular murmur, but the subjective symptoms of pain, fever, later of the exudate from the pericardial or pleural sac, will assist in the diagnosis.

A friction murmur of the apex without inflammatory or other morbid change of the pericardium is occasionally heard when the stomach is fully dilated with gas, or after a heavy meal, the upward pressure of the distended organ against the diaphragm being the apparent cause of the friction sound. I have heard this in several instances in active, powerfully built men who are examined shortly after a heavy meal. There was an unquestioned rasping or grazing friction sound heard at the apex, and which I was unable to account for until subsequent examination a few hours later, after the stomach had emptied itself, showed the true character of the phenomena. It is evidently due to the upward pressure of the distended organ pushing the diaphragm and walls of the pericardium upward and impinging on the heart during the cardiac revolution.

Concerning the cause of this peculiar sound I am inclined to believe that the explanation of Professor Bristowe is the true one, namely, the thrust of the heart's apex against the overlapping portion of the lung expels the air suddenly from the vesicles and produces an audible whiff or murmur. I am free to admit that this does not explain accurately all the peculiarities of the murmur in question, but I am also of the opinion that a friction sound at the apex due to some slight change in the position of the organ, to a distended stomach or to individual peculiarities, is perfectly compatible with a healthy pericardium and pleura. In other words, it becomes necessary when examining the heart and having discovered a murmur at the apex, systolic in character, to exclude all valvular changes as the cause for the sound before assuming that the murmur in question can be either cardio-vesicular or friction.

Having satisfied one's self that the heart is not dilated or hypertrophied, that the pulmonic second sound is not accentuated and that the condition of the blood as shown in the color, build, physique, general appearance of the patient, will in all probability exclude all hemic blood murmurs, we must then assume that the cause of the sound is without the cavity of the heart. By holding the breath, by varying the position

and by satisfying ourselves that the sound does not vary in character during inspiration and expiration, that it has none of the crescendo and diminuendo character of which Bristowe speaks, we can then exclude a sound produced in the air vesicles of the lung, for with the lung fully expanded and the glottis closed, the escape of air from the vesicle on percussion of the heart muscle is prevented. This leaves us the simple, grazing friction sound of the apex which we must establish by percussing the stomach, noting whether it is filled with gas or fluid, and by placing the individual in the prone, sitting, standing or leaning forward positions and noting the varying effects of the change of position upon the sound itself. The friction sound heard with the patient sitting will usually disappear on his assuming the recumbent position.

If, in spite of all these tests, a murmur is still heard, and yet evidence goes to show that a true valvular lesion is improbable, we are justified, in my belief, in assuming that from nervous causes, from excitement during examination, from some unknown factor controlling the vaso-motor apparatus, we may have to deal with a functional leak of the mitral valve due to unequal tension of the valve leaflets, or to undue or unequal innervation of the fibro-muscular ring of the valve itself. Such murmurs I have occasionally differentiated by having the patient lie prone on his back with both hands lifted in the air and holding a heavy book to bring some strain upon the muscular apparatus, or an occasional few minutes' exercise by walking rapidly around the room will so restore muscular tone that the valve lips close firmly and the sound disappears.

The discussion which followed was participated in by Drs. F. Wells, Hamill, Paddock, Rex and Wilkins.

Dr. Thomas Craig then read by invitation a paper on

THE TECHNIQUE FOR THE DETECTION OF THE TUBERCLE BACILLUS IN SPUTUM, AS IT AFFECTS THE LIFE INSURANCE RISK.

To the medical examiner a very great importance attaches to the microscopic examination of the sputum as an aid in diagnosis. The questions of policy renewal, or the taking out of additional insurance or of even the examination of the case in the first instance, are frequently points that have to be decided by the medical examiner, so it is imperative that he be able to decide whether or not a so-called "trivial cough" with, it may be, a slight amount of expectoration, is tuberculous or otherwise. The microscope will reveal, far in advance of the physical signs, certain diseases, but for practical purposes, the examination of the sputum for the detection of the tubercle bacillus is the most important.

The value and interest of this is yet more forcible when it enables us to state positively, whether or not a sputum is tuberculous; for on this decision will depend whether or not a policy shall be issued or renewed, or whether or not additional insurance shall be granted. It is to the wise judgment of the medical examiner that the insurance company must look to prevent its accepting what may prove to be a bad risk. To fail to do this places the responsibility for the error on the medical examiner; and in order that we may be able the better to guard against this mistake, I invite your attention for a brief time to the technique for the detection of the tubercle bacillus in sputum. Many and varied are the methods which have been proposed. But after all it is largely owing to the technique employed, and to the experience of the observer, that the results obtained are due. I need hardly say that it requires a ready and close acquaintance with the modern high-power microscope, and familiarity with the use and application of stains; and freedom from color blindness. In addition the observer must be able to distinguish those organisms and constituents usually found in the sputum both in health and disease. The quantity and condition of the sputum vary with the disease. The quantity

varies from the merest trace to an amount exceeding a liter; likewise the specific gravity varies from 1004 to 1037; the reaction of the sputum is always alkaline. The color depends on the disease, and further on the particular stage of the disease, as does also the odor. The abnormal constituents of the sputum are very numerous—thus we may have white blood corpuscles, salivary corpuscles, epithelium from different parts of the respiratory tract and mouth, elastic fibers, crystalline bodies as first observed by Leyden, and now known as the Charcot-Leyden crystals; fibrinous coagula, connective tissue, corpora amylacea, particles of food debris, parasites; and under this head they may be divided into pathogenic and non-pathogenic, such as moulds, yeasts, sarcinae, leptothrix, the different varieties of cocci and diplococci; and many different kinds of bacilli. Indeed, according to one writer, he recognized and described twenty-two different kinds of mouth bacteria.

But it would carry us far beyond the intent of these notes to enter into any description of these parasites. The only one to which I shall allude is the tubercle bacillus, and we will consider its detection in the sputum. Tubercle bacilli when stained are seen to consist of delicate rods 1.5 to 3.5 μ . in length and about .2 μ . in thickness; although these dimensions are by no means constant even in the same specimen. They are sometimes described as being about half the diameter of a red blood corpuscle. These bacilli are usually slightly curved or two of them are arranged end to end so as to form an angle. In almost any preparation quite a number of unstained cross markings may be seen, giving one the idea that the bacillus is made up of a number of segments or separate bodies closely approximated. Much controversy has been waged as to what these unstained spaces are—some claiming that they are spores. I have never heard of any one having stained them as spores.

The bacillus tuberculosis is non-motile, and cannot be recognized in an unstained condition. The first care in the detection of this organism in the sputum is its collection and preservation. I need hardly mention that

the receptacle in which the sputum is placed should be clean.

Many persons have an erroneous idea as to the kind of sputum to collect. It is safe to assert that in all tubercular pulmonary trouble, there always exists a certain degree of catarrhal inflammation of the pharynx and larynx—and that the exudation from these localities is first expectorated; hence if the sputum from these sources is collected it may fail to reveal the presence of the tubercle bacillus. The person should be directed to expectorate this material; and follow this by an effort to raise the tracheal and bronchial exudate, and it is these latter specimens which should be examined.

The character of this tracheal or bronchial excretion may be thin and watery, or, conversely, it may be thick or almost leathery; but almost always in this sputum may be found small, hard, cheese-like masses or flocculi. In cases in which the expectoration is scanty, it will be found that the early morning is the best time to procure the specimen. A small, closely stoppered, wide-mouthed bottle is the best thing in which to place the sputum, and if it is to be sent to any distance or kept for any length of time, a few drops of pure carbolic acid should be added in order to stop bacterial growth. If the specimen is very thick and tenacious, or if for any reason it has become dry and hardened then it becomes necessary to thin it down. This is done by means of a solution of caustic potash which is mixed with the specimen until it is of the proper consistence, the chemical being subsequently gotten rid of by washing the sputum after it is fixed to the cover glass, preparatory to staining. If, on the other hand, the sputum is very thin and watery, then resource is had to centrifugation, by which means all the solid particles, and with these the tubercle bacilli, are thrown down into a small bulk at the end of the centrifugal tube. Koch, the discoverer of the tubercle bacillus, was the first, as we all know, to suggest a means by which it could be stained; and since his time many different ways have been proposed for its recognition; as those of Koch, Gibbes, Neelson, Balmer, Fräntzel,

Kuhne, Frankel and Gabbet. These methods all depend on the remarkable property which this bacillus displays of staining with aniline dyes in alkaline solution, and unlike the other micro-organisms, pathogenic and non-pathogenic, which occur in sputum, of retaining the dye in after-treatment with acid and alcohol. The tubercle bacillus can be demonstrated by any of the methods mentioned when sufficient skill has been obtained; but some of them have the objection of laborious technique and of consuming considerable time. Thus when the earliest methods were brought out, it took twenty-four hours to completely stain a specimen of sputum. As the investigators became more and more familiar with the working of these aniline stains, and the recognition of this organism, the technique was more and more simplified and improved; and thus the time element was rendered shorter and much more certain and satisfactory results obtained.

COVER GLASSES AND SLIDES.

One of the first requisites in the staining of sputum is to have clean cover glasses and clean slides, and in order to have these it is necessary to subject them to the prolonged action of some agent that will remove all the grease and dirt. This can be easily accomplished by boiling them in a mixture of bichromate of potassium solution and sulphuric acid and subsequently washing them in clean water. For immediate use they are most conveniently kept in alcohol in closely stoppered glass jars.

Now, then, as to the procedure of preparing and staining a specimen. The sputum being of the proper consistency is poured into a clean glass or porcelain vessel, or, what answers better, it is poured on a piece of glass, the under side of which has been blackened. We are thus enabled to detect any cheesy or flocculent particles, for it is in these cheesy or flocculent masses that we are the more certain of detecting the tubercle bacillus. A looped platinum needle is then taken and sterilized in the flame and search is made in the sputum for any of these cheesy masses, and if these cannot be found

then a tiny particle of the thickest part of the sputum is taken, say a piece as large as the head of a pin, and this minute mass is then transferred to the surface of a clean cover glass. A second cover glass is taken and laid evenly and flatly over it. Then grasping the two cover glasses between the thumb and forefinger a pressure is exerted sufficient to crush and spread out the mass contained between these cover glasses, this object being aided by a sliding to and fro motion until the sputum is equally pressed over the surface. The cover glasses are then separated by sliding one off the other. They are then exposed to the air and allowed to dry. When they have become thoroughly dry they are passed three times slowly through the flame of an alcohol lamp or a Bunsen burner by means of a pair of forceps. Great care must be exercised to avoid heating it too much, for too great a degree of heat will burn the preparation, causing it to become of a brownish color, and thus it will be useless, as everything on the glass will have been burned and thus destroyed. The object of passing the cover-glass preparation through the flame is to coagulate the albumen in the sputum and cause it to adhere tightly to the surface of the glass, so that in the subsequent washing the material will not be floated away. The albumen being thus fixed to the cover glass and having entangled in its meshes the micro-organisms and epithelial debris, we next proceed to stain the preparation.

It may not be out of place to hastily run over a few of the best known and tried methods.

THE EHRLICH-WEIGERT METHOD.

Place in a watch glass a little anilin methyl-violet solution, float upon the surface of this the cover glass with the dried film downward; heat over a small flame until it begins to steam, then allow it to stand from two to five minutes; decolorize in a tray containing one part of nitric acid to three parts of water, the cover glass held in the forceps, and gently moved back and forth in the decolorizing solution for a few seconds. It is then washed off in sixty per cent. alcohol in order to remove the color set free by the acid, then in water.

For a contrast stain a saturated aqueous solution of vesuvin may be used, a few drops being left on the cover glass for five minutes. The stained preparation is then washed, dried and mounted in xylol balsam.

THE ZIEHL-NEELSON METHOD.

Float the cover glass upon the carbol-fuchsin solution, heat gently until steam begins to rise, from three to five minutes will usually be sufficient; wash off in water, and decolorize in nitric or sulphuric acid twenty-five per cent. solution, then in sixty per cent. alcohol for a very short time, to remove remaining color from albuminous background; wash well in water and mount in xylol balsam.

FRIEDLANDER'S METHOD.

Spread and dry the sputum on the slide; fix by passing the slide three times through the flame of an alcohol lamp or a Bunsen burner; place upon the dried film three or four drops of carbol-fuchsin solution; heat gently over a flame until steam is given off; wash in a dish of distilled water, and a few drops of the following decolorizing solution: acid nitric (pure) 5. c.c., alcohol (eighty per cent.) enough to make 100. c.c.; usually the preparation will be decolorized in about half a minute; wash in water; add a few drops of an aqueous solution of methylene blue as a contrast stain; allow the stain to act for about five minutes without heating; wash again in water; dry and mount in xylol balsam.

GABBET'S METHOD.

In this method the contrast stain is added to the decolorizing solution; for example, the specimen is first stained in the carbol-fuchsin solution; and is then placed in the following solution for several minutes: acid sulphuric (twenty-five per cent. solution) 100. c.c., methylene blue 2. c.c. It is then washed, dried and mounted in xylol balsam.

The method which I have used differs slightly from the ones just described, and is as follows: the cover glass is fixed, preparation side up, in the jaws of a self-retaining forceps. The carbol-fuchsin solution is then dropped on until the glass is completely covered. The forceps are then picked up and the preparation is passed back and forth through the blue part of the flame until it steams. This is continued for several minutes, care being taken to prevent the specimen from becoming dry. If the coloring agent should evaporate too much, then more is added. Having thus intermittently heated the specimen for several minutes it is immediately washed under a stream of water until the water comes away clear; then the next step, that of decolorization, is made. A twenty per cent. aqueous solution of nitric acid is poured into one dish, a sixty per cent. solution of alcohol in water is poured into another dish, while into another one distilled water is put. The specimen, still in the jaws of the forceps, is then submerged in the acid mixture, and kept there for a varying number of seconds, depending on the depth of color and thickness of the preparation. The color quickly changes to a yellowish green; it is then repeatedly dipped in the alcoholic solution, shaken around and examined from time to time. When all the red color is discharged, a slight pinkish or violet hue, only, being left, it is then washed thoroughly in the water; and then the next step in the series is taken, viz.: contrast staining. To do this the specimen is covered with the methylene blue solution, which is allowed to remain in contact with it for from three to five minutes. At the end of this time it is again thoroughly washed in distilled water, gently dried over the flame, and mounted in xylol balsam.

If our technique has been successful, we will find the tubercle bacilli stained a bright red, while all other organisms will be stained a deep blue. It is not necessary to stain the tubercle bacilli red; if preferred the stains can be reversed and the tubercle bacilli can be stained blue, and all the other organisms red; but the former is the almost universal mode of procedure.

STAINS.

The stains referred to in the foregoing methods are as follows:

Carbol-Fuchsin Solution (Ziehl's solution):

Fuchsin, 1 c.c.

Alcohol, 10 c.c.

Dissolve and add 100 c.c. of a five-per-cent. solution of carbolic acid.

Alkaline Blue Solution (Löffler's solution):

Saturated solution of methylene blue, 30. c.c.

Solution of caustic potash, 1 to 10,000, 100. c.c.

These solutions keep better than the simple aqueous solutions, but after having been kept for a time they are likely to lose their staining power as a result of the precipitation of the aniline color.

Aniline Methyl-Violet (Ehrlich-Weigert):

Saturated alcoholic solution of methyl-violet, 11. c.c.

Absolute alcohol, 10 c.c.

Aniline water, 100 c.c.

Aniline water for the above solution is prepared by shaking in a test tube one part of aniline oil with twenty parts of distilled water, and after allowing it to stand for a short time, filtering the saturated aqueous solution through a moistened filter. If the filtrate is not perfectly transparent it should be filtered a second time.

SPUTUM FROM SPECIMENS OF HÆMOPTYSIS.

In cases of hæmoptysis, no matter how intimately the blood may be mixed with the sputum, it is possible to prepare, stain and recognize the tubercle bacillus. I have examined the frothy blood-stained expectoration in cases of hæmoptysis, and frequently found the tubercle bacillus. This then becomes exceedingly important as a diagnostic factor in these cases.

THE CENTRIFUGAL MACHINE.

By means of the centrifugal machine it is now possible to concentrate or gather into one end of a conical tube all the

solid materials in any liquid; and when sputum is subjected to this process it is possible in a very few minutes to throw down all the solid particles in it. By thus treating thin saliva-like sputum it is comparatively easy to obtain the solid masses and organisms in it.

In this way it is now possible to detect the tubercle bacillus in urine.

The centrifugal tube is filled with the suspected urine, and all the solid particles thrown down, the clear supernatant fluid is decanted, and the precipitated materials transferred, by means of a pipette, to the smaller centrifugating tube, which is then placed in the hæmatocrit arm, and the particles again thrown down in this smaller tube; they are then contained in a few drops of fluid, which are transferred to a slide, dried, fixed and stained.

In making an extensive search for the tubercle bacillus, if a very large area of stained sputum is desired, we sometimes take a glass slide and cover almost the whole surface of it with a thin layer of sputum; fix and stain it; and then by means of the mechanical stage the whole area can be mathematically searched. By this means we are enabled to quickly examine a very large area and a considerable amount of sputum in a short space of time.

GUINEA-PIG METHOD.

Whenever in any case tuberculosis is suspected, and the microscope fails to reveal it, then recourse is had to inoculating a small quantity of the sputum into a guinea-pig, this animal being very susceptible to tuberculosis, especially by inoculation. This little operation is generally performed as follows: A place at the lower part of the abdomen is chosen, the hair is all removed from a small area, and the skin is then washed with a 1 to 20 solution of carbolic acid. A small fold of the skin is then pinched up and a cut made into it, forming a flap or valve-shaped opening. In the cellular tissue underneath this flap a small hole is torn, and the suspected sputum is then introduced into this space. The flap is then replaced

and sealed by means of collodion. At the end of three weeks the animal is killed and the lymphatic glands nearest the wound are examined. If tubercle bacilli have been inoculated the glands will be found enlarged and suppurating. Some of this broken-down material is then taken and a cover glass preparation is made and examined; or if the gland has not broken down thin sections of it can be made, stained and examined for the tubercle bacillus.

ESTIMATING THE NUMBER OF TUBERCLE BACILLI IN SPUTUM.

Some observers even go to the extent of estimating the number of tubercle bacilli in the sputum. This is extremely difficult to do, and leads to very little practical good; but it may not prove uninteresting to tell how it is done. "It consists essentially in first making the sputum fluid by the addition of a solution of caustic potash; in then shaking it thoroughly in a bottle containing sterilized gravel or pounded glass; in carefully measuring the total quantity of fluid, and in dropping on glass slides uniform drops by means of a graduated pipette; in spreading these uniformly by means of a platinum needle and a turn table; in covering the dried film with a film of blood serum, and coagulating this by heat; and finally in staining and counting the bacilli in a series of slides from the same specimen, and from the average number found in a single drop estimating the total number in the sputum for twenty-four hours."

In this way it has been estimated that an ordinary case of pulmonary tuberculosis with the usual quantity of expectoration casts off in a single day about seven millions of tubercle bacilli.

At the close of the paper he gave a demonstration of his method. On motion of Dr. Shepherd, the Association passed an unanimous vote of thanks to Dr. Craig for his courtesy, and requested a copy of

his paper for publication in the transactions of the Association.

Dr. Symonds then read a paper entitled:

A PLEA FOR UNDERGRADUATE INSTRUCTION IN MAKING LIFE INSURANCE EXAMINATIONS.

Should a course of instruction on making examinations for life insurance be included in the curriculum of the undergraduate medical school? This is the subject which I wish to present to this meeting for discussion.

Naturally, the first thought is, whether the subject is of sufficient importance to warrant a medical student giving any time to its pursuit. Many other subjects of genuine value, such as micro-photography, anthropometry, etc., must be omitted from the regular course because they interest but few, and are of slight practical service. A student who wishes to study these branches must make his own research outside of the regular curriculum, which is usually so full that it leaves him no spare time until after graduation. Such a procedure is not fair in this case either to the life insurance companies or to their examining physicians, who are always graduates in medicine. The teachers in medical schools do not realize to what extent the profession is indebted to these companies, for their work usually lies away from this branch of medicine. Furthermore, in the largest cities examining for life insurance has become specialized in the hands of a few, who to a considerable extent grow out of touch with the medical profession in general. But these conditions do not hold good for the rest of the country, in which most of the policies are written. There the practitioner is also the medical examiner and very willing to do the work. He is glad to have appointments from any number of life insurance companies, the more the merrier, and his pleasure is still greater at the end of each month, when he collects his bills, 100 per cent. good.

There are approximately about 200,000 appointments as medical examiner in the United States and Canada. Many

men, however, hold two or more appointments, so that the real number of examiners is probably about 50,000. The regular life insurance companies divide about \$5,000,000 annually among these men. This certainly constitutes a very welcome addition to their united income, and it becomes still more important when we consider the growing dispensary abuse. Moreover, the appointment as examiner for a life insurance company is an honorable one and confers distinction on the holder. It should improve his standing, enlarge his acquaintance, and increase his practice. Furthermore, it brings him in contact with healthy conditions and this occasional change must be pleasant to the physician, however much he is interested in his profession. Whatever the cause may be, these positions are held in much esteem by medical men. The appointments are usually kept until the end of their active work, and sometimes even longer, to the discomfiture of the company. Certainly the subject we are now discussing is entitled to consideration for many reasons, perhaps not the least being the pecuniary reward involved.

But it may be asked whether the course of instruction at a first-class medical school does not convey all the information needed to make one a good examiner. Nowadays the medical student is well taught. He learns physical diagnosis from the living subject. He is competent to make a thorough urinalysis. He has considerable knowledge of the symptomatology and prognosis of many diseases, learnt from the bedside as well as from lectures and books. Are not these qualifications enough to enable him to examine healthy people and pass upon their merits? The answer must be No. There are several reasons why he is as yet unfit for this work. One is that he is now dealing with average health, for that is all a life insurance company requires. It does not demand or expect paragons of health, who are anatomically and physiologically perfect. There are very few living but what have some flaw in their armor. The alert young M.D., fresh from his school, hunts over his applicant, like a terrier quartering a field, until at last he finds a pinhole. Now that

pinhole is really of no consequence, but it gradually grows larger in his eyes until it becomes a vital defect, and he rejects the unfortunate applicant, or else he approves him with a very qualified recommendation, and writes a many-paged letter to the home office, which completes the ruin of the case. Then probably a prospective friend becomes an enemy, the agent is thoroughly disgruntled, and the medical department is discredited. Not only is such an excess of zeal harmful to the company but it also injures the examiner in his professional work. The man whom he has thus refused to pass makes the matter personal and both he and the agent give vent to their displeasure. Some other examiner, of no greater skill but of larger experience, passes judgment upon the case and accepts him for another company. Then the clamor of the rejected applicant and the disappointed agent is redoubled and the first examiner suffers in the estimation of his townsfolk and perhaps in his own self-esteem. This latter sensation is wholesome, and to be commended, unless it goes to an extreme, when it may lead to other difficulties.

The young practitioner is accustomed to deal with sick people or those who think themselves sick, and who tell him everything and frequently a great deal more. He learns to sift the wheat from the chaff and thus he gets into the habit of attaching less value to the statements of the sick and of depending more and more upon the physical diagnosis. Now, if he maintains this attitude in his relations with an applicant for life insurance, he is very apt to get both himself and his company into trouble. If he omits to record the very trifling hæmoptysis which the applicant says he had three years before, he may easily force a case of latent tuberculosis upon the company. We all know by painful experience how the laity minimize the significance of hæmoptysis, if pulmonary trouble does not follow immediately, and in this course they are often helped by the attending physician. Naturally they are alarmed at first, but as time goes by without any manifest damage to the health, their fear is allayed and they think that it came from the nose or the tonsils or any place but the

lungs. Furthermore, we know the difficulty of diagnosing latent tuberculosis by means of the physical signs alone, if it has been checked in the early stage. But it often takes very little to stir up this latent trouble into activity with the usual results. Consider syphilis as another example. Any man is ashamed to confess that he had it and puts it as remote in his life as he can. All of us have seen cases where a simple venereal ulcer with only local treatment gradually developed, under skilful cross-questioning, into typical syphilis with the usual symptoms and course. Such self-deception is a curious and interesting psychological study. I do not think that it should be grouped in the same category with downright lying and perjury. It rather comes somewhere in the scale between these, and those white lies which are said to be the cement of society. It is undoubtedly a very common fault, and is well known to an examiner of experience. He learns to watch for it, to recognize it, to overcome it, and to obtain in spite of it some fair idea of the truth. But he reaches the knowledge only by hard experience, and in his earlier work of examining doubtless made costly mistakes. For it is not reasonable to suppose that any man can intuit such knowledge. He can only learn it by the experience of himself or of others.

The relations between the agent and the examiner are antagonistic and at the same time identical. They are antagonistic because any agent, no matter how honest he is, thinks naturally that all his cases should be passed at once, while the examiner is occasionally obliged to tell him that some of his cases are geese and not swans. No man enjoys being told this, and yet it does seem to the agent at times as if an examiner went out of his way in order to be irritating and disagreeable in the telling. He seems to forget that the agent has worked hard on the case and will probably have to work still harder before he can deliver the policy. Policies do not grow on every bush, but have to be sought for and tended with great care in order to make sure of the ripe fruit. In this pursuit an examiner can be of much assistance without in any way lowering his dignity, and incidentally he can

benefit himself without harming the company. Until an examiner learns the golden mean between antagonism and sympathy, he is very apt to adopt one or the other extreme, to the great harm of proper insurance. On the one hand, he regards with suspicion every agent and apparently begrudges him the time and energy needed to make an examination. On the other hand his duty may become more and more shadowy, for the company is remote and the agent is the only personal representative with whom he comes in contact. His sympathies, therefore, naturally lean more and more towards the agent, until at length he loses sight of his obligation to the company, and in the hands of an unscrupulous agent becomes a serious menace. Many examiners do learn to reconcile these conflicting interests, but only after considerable experience. How much better and quicker they would get the knowledge if they obtained it first from the experience of others.

The frauds and fraudulent practices in life insurance constitute another point of great importance. The best examiner may be deceived sometime, but fortunately these criminals are usually only cunning and not intelligent. An examiner who knows when to suspect a fraud and how to prevent it, has but little difficulty. But if he meets it in his early days, it may put an indelible stain upon his shield. How much better for him if he had been prepared by the experience of others to avoid this.

Undoubtedly many other important aspects of this subject occur to you all which might be very properly introduced into such a course of instruction, but I trust enough has been said to show the importance of the subject and the need of education therein.

A course of instruction in the art and science of making life insurance examinations need not be very long. In six or eight lectures all the important points could be discussed to the necessary degrees of fullness. Such a course should cover at least the following topics:

1. Some instruction in vital statistics and the fundamentals of life insurance;

2. The relations of the examiner to the company and the applicant;
3. The facts, concerning each disease, which are of importance from a life insurance point of view;
4. Habits, occupation, and environment;
5. The family record and heredity;
6. The physical examination, particularly with reference to the distinction between essentials and non-essentials;
7. The relations of the examiner to the agent;
8. Frauds and fraudulent practices.

Now, the question is, where should this instruction be given. Post-graduate schools can be excluded at once, because of the limited number of practitioners who attend them. There remain, then, only the regular medical schools, and it is in them that we should expect to find such a course as part of the regular curriculum. Look over the catalogues of the medical schools in this country and Canada, including all of the first rank, and in how many will you find provision for instruction in making life insurance examinations? Just two, and they are the Medical College of Virginia, at Richmond, and the University of Minnesota, at St. Paul. At the former the course is given by Dr. J. B. McCaw, who is doubtless known personally to many of you. Dr. McCaw's letter is as follows:

"RICHMOND, VA., May 5, '99.

"DEAR DOCTOR:

"I have given to the graduating class of the College six lectures on the question of Life Insurance, which seem to be satisfactory. My theme was rather freely to warn them not to tire at the details of the examination, because there was not a single point made which was not studied out and the deductions drawn from absolute facts. Therefore, make no cuts or abbreviations. I taught them the moral aspect of the case, never to forget that they represent the company, never to compromise their own responsibilities or have anything to do with the application. but with an eye singly to their own duties, to protect their company from foul play of every sort,

and while willing in any way to help the agent or solicitor, always to see that the company was protected.

"You know how essential this point is.

"Yours very truly,

"J. B. McCaw."

At the University of Minnesota the course is given by Dr. C. L. Greene.

Dr. Greene's letter is as follows:

"ST. PAUL, MINN., May 9, '99.

"BRANDRETH SYMONDS, M.D.,

"*Mutual Life Ins. Co., New York.*

"MY DEAR DR. SYMONDS:

"I beg to acknowledge your favor of recent date asking for information concerning the course of lectures at present offered by the University of Minnesota. I gave this spring sixteen lectures under the heading of Life Insurance and Case Taking, but chiefly relating to the medical aspect of insurance. In my first lecture, I traced the growth and development of the life insurance scheme and explained its nature. Several lectures were then devoted to the consideration of the duties of the medical examiner, and the actual methods of procedure to be used in making an examination, dealing, of course, with the triple responsibility of the examiner, sounding a warning against the common errors and mistakes of which he is often guilty, and taking up briefly each subject concerning which questions are asked in the application. I tried to explain in each case exactly what information the company desired and what lines of investigation should be pursued in order to properly complete an application for insurance. Special lectures were devoted to the consideration of the examination of the heart, lungs, and urine. The subject of Sub-Standard Lives, Attempts to Defraud Insurance Companies, Heredity and Occupation were also considered. I was very fortunate in being able to use a large number of illustrations, plates, and tables which seemed to add much to the interest of the lectures and to the clearness of the exposition. I may add that, although this course was offered

as an elective, it was very faithfully attended by all the senior class, and I understand it to be the intention of our Dean to make it a required course hereafter. I personally am anxious that this should be done, and believe that examinations should be held upon the subject. It is a most encouraging sign that our insurance companies have begun to interest themselves actively in securing recognition for this especial department of medical work. The young physician is tremendously hampered in the early years of practice by the lack of both practical and theoretical knowledge of this subject. The instructions issued by various companies are very good, so far as they go, but they do not go far enough to be of material service to the examiner in defining his relation to the home office, agent and applicant, the exact meaning and scope of the medical examination, the absolute necessity for accuracy in small things and the no less great necessity for barring trivial ones. It was the universal expression in our class this year that the lectures, imperfect as they were, had proven of great interest and value.

"Yours very sincerely,

"CHAS. LYMAN GREENE."

We need to put forth our best endeavors to remedy this condition, and to bring to the attention of the profession this serious defect in the present curricula. Whether, gentlemen, it would be advisable for this Association to take official action in this matter is, of course, left to those who have been longer in its service and are wiser in its needs.

At 1 P.M. the meeting adjourned, discussion of the paper having been postponed until after luncheon.

At 2.30 P.M. the session was resumed with the discussion of Dr. Symonds' paper. Dr. F. Wells supported the position taken by Dr. Symonds, and urged the appointment of a committee of three (3)

to bring the subject to the attention of the medical schools.

The motion was seconded by Dr. Emery and carried.

Dr. Devendorf recommended that the Committee draw up a resolution addressed to the medical colleges expressing the views of the Association. Dr. Brannan suggested that, as the amount of work now done by undergraduates was already very large, the establishment of a short course of instruction in each school would be much more valuable than a special chair.

Dr. Fisher urged the importance of accumulating data for the use of colleges in the education of examiners. Dr. F. Wells read a few letters of many recently received from various medical colleges on the subject, and offered the following resolution:

"WHEREAS, instruction in making examinations for life insurance has been demonstrated to be both important and necessary to the proper equipment of medical practitioners;

"Resolved, that the Association of Life Insurance Medical Directors earnestly urges upon medical schools the need of such instruction in the regular curriculum."

This resolution was seconded by Dr. Rogers, and carried.

Dr. Campbell said that the Faculty of Yale Medical School was now preparing to teach life insurance examining. Dr. Wilkins reported the same for McGill; Dr. Hamill said that the same was true of the Philadelphia schools, and Dr. Thorburn said that similar work was being done at Toronto.

The President appointed Drs. F. Wells, Marsh,

and Rex a committee to carry out the wishes of the Association on the subject.

The subject for general discussion, "Build, Height and Weight—its Bearings upon Longevity," was then opened by Dr. Shepherd and continued by Dr. Fisher.

Dr. Rogers presented to the Association a graphic standard table of heights and weights which he had devised for use in the Medical Department of the New York Life Insurance Co.

The discussion was then continued by Drs. Hamill, Wilkins and Marsh, and Dr. Shepherd closed the subject.

Dr. F. Wells then offered the following resolution:

"Resolved, that the sincere and appreciative thanks of this Association be extended to our hosts for their uniform attention to the comfort and pleasure of its members."

This resolution was carried.

Dr. Shepherd submitted an Amendment to Article 5 of the Constitution so as to read, "The President, Vice-President and three other members, not officers, shall constitute the Executive Committee." This was laid over under the rule, until the next annual meeting.

The President appointed Drs. Ross, Paddock and G. W. Wells to read papers at the next annual meeting.

The meeting then adjourned.

The annual banquet of the Association was held at the University Club, 54th Street and Fifth Avenue. Dr. Tabb presided. Dr. Wilkins responded to a toast to "Her Majesty the Queen," Dr. F. Wells to

the toast, "The President of the United States." These were followed by remarks by Drs. Craig, Shepherd, Grant, Thorburn, Hamill, Munn, Lambert, Willard, Emery, Brannan, and Van Wagenen.

THE ELEVENTH ANNUAL MEETING.

The Eleventh Annual Meeting of the Association was held at the office of the Equitable Life, 120 Broadway, New York, on May 31st and June 1st, 1900, the President, Dr. Shepherd, in the Chair. There were present at some time during the sessions the following members: Drs. Alton, Bickerton, Bross, Burrage, Chapin (Home), Curtis, G. P. Davis, J. L. Davis, Devendorf, Emery, Fisher, Grant, Grassett, Hamill, Holden, Homans, King, Knight, Kucher, Lambert, Marsh, Morgan, Munn, Natress, Northcott, Paddock, Pardee, Pell, Rex, Rogers, Root, Scadding, Shepherd, Tabb, Thorburn, Van Wagenen, Webb, G. W. Wells, White, Wilkins, Willard, Woolverton, Wood, and Young: 44 members.

The minutes of the last annual meeting and of the meetings of the Executive Committee were read and approved.

The President then delivered an address on the past and future of Life Insurance Medicine.

The following gentlemen were unanimously elected to membership in the Association:

Dr. Charles D. Alton, Connecticut Mutual Life.

Dr. W. E. Dickerman, Ætna Life.

Dr. F. L. M. Grassett, Canada Life.

Dr. Joseph B. Hall, Connecticut Mutual.

Dr. P. H. Ingalls, Ætna Life.

Dr. Augustus S. Knight, Metropolitan Life.

Dr. R. L. Lounsberry, Security Mutual.

Dr. Howard A. Pardee, United States Life.

Dr. Arthur Pell, Equitable Life.

Dr. H. C. Scadding, Canada Life.

Dr. Morgan read an appreciative memorial of Dr. James Campbell, late Medical Director of the Ætna Life Insurance Co. and a long-time member of the Association.

The recommendation of the Executive Committee, that the Association authorize the publication of the Constitution and By-laws of the Association, down to and including those passed at the present meeting, together with a list of members of the Association, was, on motion, adopted.

The Amendment to Article 5, as referred from the last meeting of the Association, was adopted after amendment as follows: "The President, Vice-President, Secretary, and Treasurer and three other members not officers shall constitute the Executive Committee."

The Amendment to Article 8 to alter the last sentence of said Article of the Constitution so as to read, "The President and Vice-President shall not be eligible for re-election," was on motion laid upon the table.

AFTERNOON SESSION.

It was moved by Dr. G. W. Wells and duly seconded, that Dr. Thomas Craig, who read a paper

before the last meeting of the Association, be invited to be present at the reading and discussion of scientific papers. Dr. J. W. Stowell of Chicago was also admitted to the scientific meeting.

Dr. Joseph C. Young read a paper on

THE PATHOLOGY AND ETIOLOGY OF ACUTE ARTICULAR RHEUMATISM.

In approaching the subject of the pathology and etiology of acute articular rheumatism, it may serve for a clearer understanding of the matter if we first briefly review the physiological action of muscle and fibrous tissue, the parts chiefly affected by the disease.

Muscle at rest is feebly alkaline; but DuBois Reymond has shown that during contraction it becomes acid, and Heidenhain has further demonstrated that up to a certain point the acid increases with the amount of work done by the muscle. This acidity is due principally to sarco-lactic acid, although phosphorus, uric acid, and some others are also found as part results of the metabolism of muscle. Sarco-lactic acid is unstable, readily undergoes change by oxidation, and is eliminated by the lungs and skin as carbonic acid and water. In normal states, it is fully eliminated by the increased perspiration which muscular activity produces. Its formation, however, goes on temporarily during the period required to recover from the fatigue which follows muscular action, and until the process of metabolism is completed and the muscle again resumes its normal alkaline state. Thus fatigue becomes a factor in its production. The acid results from the metamorphosis of the non-nitrogenous elements of muscle, which exist in muscle in the form of glycogen or glucose, and the amount of it produced in rheumatism is often enormous. From the nitrogenous elements of muscle we get another important product of tissue metabolism, viz., uric acid, which undoubtedly plays a part in the production

of some of the symptoms of the disease, and which, indeed, Haig believes to be the essential cause of it, as well as of gout, migraine, and many other diseases. Now, we know that an excess of uric acid produces a marked vaso-motor disturbance with resulting contractions of the small arterioles. If this factor then be also brought into play during rheumatism, we have introduced another disturbing agent in the nutrition of the muscles and fibrous textures, with a still further increase in the products of tissue waste, as the result of deficient oxidation from lessened blood supply.

Now, let us suppose that a person predisposed to rheumatism receives a sudden wetting or chilling of the body while the skin is perspiring and the system overheated and fatigued by muscular action; and I cite this illustration because the disease is found to have such an origin in about 55 per cent. of all cases. What happens? We have developed a fever of a high degree of intensity, accompanied by inflammation of some or many of the muscular and fibrous textures of the body. To the muscular activity, muscular fatigue, and the products of muscular metabolism we have added the still further muscular disturbances which attend inflammatory action. The function of the skin being arrested by the chilling process, the metamorphosis and elimination of lactic acid and other products of tissue waste are arrested in whole or in part; they accumulate in the system and an acute attack of the disease results. It has been demonstrated by both Foster and Haig that both lactic and uric acid will produce pain and irritation in muscles and joints.

Following the suggestion of Cantain, Foster administered lactic acid for the cure of a case of diabetes, and produced six different arthritic attacks, corresponding in all respects to those characteristic of acute rheumatism, coming on when the acid was given and ceasing when it was discontinued; and Haig has repeatedly shown that conditions which interfere with the elimination of uric acid produce irritation and pain in the joints and fibrous tissue. But to admit these facts is not to admit that those products are the causes of rheumatism. Their presence in excess in the system may be

granted, but that does not answer the question—What produces such excess?

Notwithstanding the fact that about one-half of the cases of acute articular rheumatism follow the sudden chilling of the body while the skin is perspiring and the system is overheated and fatigued by muscular activity, nevertheless, something more than this is necessary to explain the phenomena of the disease. Were this all, no one could reasonably expect to escape rheumatism at some period of his life, for every one is at times so exposed. Cold climates would, under such circumstances, yield the larger quota of cases, which they do not; indeed, the disease is rare in cold climates. Moreover, we should have no explanation for the large balance of cases where cold or dampness cut no figure, and none for the recurrent attacks occurring while the patient is in no way exposed to such cause. There is undoubtedly some *materies morbi*, the nature of which is yet unknown, and no theory of rheumatism so far advanced explains more than a part of the phenomena observed in the disease. Whatever may be the nature of the poison which produces rheumatism, it is evident it must either be germinated within the system or introduced from without, and there are earnest advocates of both views, and ingenious theories to explain the phenomena of the disease upon either hypothesis. It is probable that the disease may be the result of the combination of more than one causative factor.

The oldest theory, which gained anything like acceptance by the profession, regarded the poison as lactic acid, produced in the manner above mentioned. Prout introduced this theory, which was further collaborated by Todd and Fuller. It was suggested by the excessive formation and elimination of lactic acid in acute rheumatism and the great frequency with which sudden checking of the perspiration, by which it is chiefly eliminated, was followed by the sudden onset of the symptoms.

In favor of the lactic-acid theory, the chief argument adduced has been that this acid is always in excess and only in such excess in rheumatism. This is universally admitted,

but it may be, and probably is, only one of the phenomena of rheumatism, a result, and not the cause. If it were the cause, the disease should persist as long as the lactic acid is present, but we know that the skin goes on eliminating the acid often for days after the attack has subsided. Alkalies should neutralize it, but the system may be saturated with them without in the slightest degree modifying the course of the disease, and the failure of Fuller's alkaline treatment has been one of the hardest blows against the theory. Again, the remedy which best effects the cure of rheumatism, salicin or its salts, does so without neutralizing lactic acid. Haig, who attributes to uric acid the chief factor in causing rheumatism, asserts that the salicylic acid combines with glycocoll, a constituent of uric acid, to form salicyluric acid, and thus abstracts uric acid from the muscles and fibrous tissues and by its elimination by the kidneys cures the disease. If lactic acid were the sole cause of rheumatism and its rapid accumulation in the blood were brought about by the sudden checking of the action of the skin, we should expect relief as soon as the action of the skin was restored by the profuse acid perspirations which are so marked a feature of the disease, and by which the lactic acid is freely eliminated. Yet it is in the very cases in which this elimination is so copious that the suffering and characteristic joint symptoms are most pronounced. To accumulate in the blood under such circumstances is to imply a constant formation of lactic acid in excess of that required to meet the demands of the increased diaphoresis, and this undoubtedly occurs. But it is the rheumatism that produces the lactic acid, not the lactic acid the rheumatism. If it were the latter, the whole of the poison necessary for an attack of days, or even weeks or months, must be introduced into the system at the commencement of the attack, and to admit this would be to admit what is impossible of belief, and what would make of rheumatism an exceedingly fatal disease.

Again, the lactic-acid theory does not take into consideration those cases of rheumatism where no chilling of the surface has followed muscular activity, nor where the patient, while warm in bed, may suffer a relapse; nor does it account for

the aching, shivering, general malaise and other evidences of approaching illness, which often precede by some days the onset of the attack, and which are to be regarded as much a part of the disease as are the prodromata of typhoid fever part of that affection.

To support the lactic-acid theory of rheumatism, Dr. B. W. Richardson instituted experiments upon dogs by injecting the acid into the system, with the result, as he supposed, of producing endocarditis or injections of portions of the endocardium, but later demonstrations by Reyler have shown that a similar condition of the endocardium exists in a dog's heart after death, whether he has been given lactic acid or not. Richardson argued that lactic acid in the blood was a local irritant and accounted for its presence in that fluid in rheumatism by affirming that the transformation of sugar into carbonic acid and water in the pulmonary system was incomplete, as a result of which one of the intermediary products in the transformation (lactic acid) accumulated in the systemic circulation, in which it was finally destroyed. But the later experiments by DuBois Reymond and Heidenhain, to which allusion has been made, have shown on the contrary that the acid (sarco-lactic) is one of the metabolic products of *muscle* found during its contraction, and thus originates in the systemic circulation. If it acted simply as a local irritant we should confidently expect endocarditis in every case, while, as a matter of fact, that complication occurs in only a moderate proportion of cases, and the inflammation would extend over the whole endocardium, instead of being confined chiefly to the fibrous textures of the valves, to the convex surface of the aortic valves and the auricular surface of the mitral. Moreover, local irritation would not account for the frequent involvement of the pericardium, nor would it exert its irritant effects upon the synovial membranes and the fibrous tissues of the joints in the manner that this theory assumes it to act upon the endocardium.

One of the strongest arguments in favor of the lactic-acid theory is afforded by the reports of three cases of diabetes by

Foster and Knelz, in which the acid was used for the treatment of that disease, and in which all the phenomena of rheumatism were produced, whenever the dose exceeded a certain point. Maclagan, however, offers a very rational explanation for this, and one which comports with the acknowledged belief that lactic acid in excess is only one of the disturbing elements in the production of joint and muscular pains, and not necessarily the cause of them. His explanation in brief is this: Lactic acid is an excretory product, like carbonic gas and urea. Its undue retention in the system exerts, as do other poisons, first a stimulating effect and secondly a disturbing action on the tissues which supply the materials from which they are formed. In the diabetic cases recorded, the excess of lactic acid, from direct administration, caused increased action of the skin and painful inflammation of the joints, the former from stimulation, the latter from functional disturbance of the motor apparatus. Lactic acid normally is readily oxidized and eliminated, but in low states of disordered nutrition, such as Dr. Foster's case (diabetes with phthisis), oxidation is very imperfectly performed, functional disturbance in muscles and fibrous tissue ensues, and the acid is retained in excess. But other disordered states of nutrition are also capable of producing such excess of lactic acid, even where none has been administered. Up to the present time, then, the evidence goes to show that lactic acid cannot be regarded as the true rheumatic poison, but only as one of the phenomena of rheumatism, capable under certain conditions of aggravating the disease, just as urea, while not the cause of Bright's disease, is, nevertheless, capable of giving rise to many of the most marked symptoms of that affection.

In connection with lactic acid as a factor in rheumatism, we should consider that other product of tissue, viz., uric acid, which undoubtedly plays an important part in the production of some of the symptoms of the disease. Haig affirms that in the urine uric acid bears a normal relation to urea of about 1 in 33. Any excess comes from its excess in the blood, but any fall in this proportion indicates that there

is little or none in the blood and that it is being stored up in the tissues. Its presence in the system comes from its introduction by feeding on substances which contain it, from its formation as a result of tissue metabolism, and from any failure of elimination. A varying amount of it is always stored up in the system. A high state of alkalinity of the blood favors its solution in that fluid and its consequent elimination by the kidneys and the skin, while any drug or disease which lowers the alkalinity or raises the acidity of the blood retards its solubility, causes its accumulation in the tissues, and, in the case of rheumatism, concentrates it in the joints and fibrous tissues, where Haig supposes it to act as a direct local irritant, probably still in solution or in suspension as a colloid quadriurate.

In a chapter on mental depression and fatigue he shows that these states mean an excess of uric acid in the blood, which explains their relation to the production of acute rheumatism. "Let there be exercise and perspiration, with increased alkalinity of the blood and uric acid-aemia, and let there supervene on this anything, such as cold or fever, which causes a marked rise in the acidity of the urine, and an equally marked fall in the alkalinity of the blood, and we have all the factors in the natural causation of acute rheumatism. The sharp fall in alkalinity will drive all the uric acid out of the blood into the joints, and the effect on the joints will be proportioned to the amount of uric acid in the blood and the rapidity with which it is driven out." This theory at least helps explain the part played by lower states of the system in the production of rheumatism, but many of the objections adduced against lactic hold good as against uric acid, and our present knowledge of the action of uric acid in the system will not permit us to explain all the phenomena of rheumatism by it.

From the joint affections simulating rheumatism, which are known to follow certain lesions of the brain, spinal cord, and peripheral nerves, and to which attention was first called by Charcot, Brown-Sequard, J. K. Mitchell, Weir Mitchell, and others, a neurotic theory has been advanced to account

for the production of rheumatism. It is pretty generally acknowledged, however, that such affections of the joints are the result of trophic changes as a consequence of malnutrition in the paralyzed parts, and the lesions thus produced are not identical with those observed in acute rheumatism. It is highly probable, however, from the close relationship which exists between rheumatism and certain cases of chorea, that some of those nervous centres which exercise inhibitory control of muscles are involved in rheumatism. The neurotic theory assumes the existence of a hypothetical centre for the nutrition of joints, necessarily located high up, because all the joints may be affected and pneumogastric irritation is common. Friedlander locates this centre near the nucleus of the vagus and glosso-pharyngeal. Canstat and Heyman advocate the neurotic theory, believe rheumatism is caused by irritation over a large cutaneous sensory nerve-surface by wet or cold, producing local vaso-motor disturbance and affections of the nerves that control the nutrition of joints. If this were true, the disease should be more common in cold than in temperate climates, more common in children and elderly people, who offer less resistance to cold, than in those of early adult life, who have the greater resistance, and we would have no explanation for the invasion of fresh joints or the occurrence of relapses where there has been no repetition of the exposure. Nor does this explanation account for the occurrence of endo- or peri-carditis, or the other phenomena of rheumatism, and it affords no reason whatever for about one-half of all the cases of rheumatism, in which there has been no exposure at all. Recognizing this defect, and that some poison circulating in the system was essential to explain the various lesions of rheumatism, Latham advanced the neuro-chemical theory, the chemical agent being uric acid, produced in the manner already mentioned. He argued somewhat as follows: The first effect of chilling is to contract cutaneous vascular areas and reflexly dilate those of muscles and viscera. Hyperemia in the latter causes molecular change and the production of lactic and uric acid. The uric acid, through the nervous centres, contracts the blood-vessels, re-

moves the hyperemia, and stops the entire morbid process, but in enfeebled states (hereditary or acquired) the power of recovery under the stimulus of uric acid is lost and vasomotor paralysis results, aggravating or keeping up the condition, increasing the production of glycogen, lactic and uric acids, with dilatation of small arteries and consequent disturbance of nutrition. The arthritis is due to impairment of the nutrition of the joints from the action of uric acid on the nerve centres that control their nutrition. The shifting character of the joint pains of rheumatism Latham believes to be due to paralysis of one area and stimulus of another. A contracted (stimulated) area sends blood in excess to a paralyzed one. If the stimulation and contraction are kept up in such area long enough to give place to exhaustion, it too becomes paralyzed and the blood is diverted back to it from some other area, thus relieving the original seats of inflammation, producing amelioration, while it is made to suffer in turn, and so on. This theory allows for the continued formation of the morbid product as long as the attack lasts, but implies the existence of a constant excess of uric acid in the blood, which Garrod and others affirm is not the case.

Similar to the neuro-chemical theory is the neuro-infection theory of Friedlander, in which the infection of the nerve centre is due to some micro-organism. The facts adduced in support of this theory are the occasional prevalence of rheumatism in an epidemic form; its comparative independence of meteorological influences; its disposition to attack the young, who are more susceptible to infections of all kinds; its resemblance to pyæmic, gonorrhœal, and septic affections of the joints, which we know to spring from specific infection; the frequent occurrence of endocarditis, an affection rarely arising independent of rheumatism or some septic process or some infection, like scarlet-fever and allied diseases; and, lastly, the very common occurrence of tonsillitis, a disease so conspicuous in many specific fevers. If we grant infection in rheumatism, it does not follow that the lesions must necessarily arise from the irritation of certain nerve centres, and, indeed, this disease is one in which the nerve centres give

least evidence of disturbance, and, as Arnozan remarks, "before pronouncing the articular lesions of rheumatism to be trophic lesions dependent on the medulla, it is first necessary to demonstrate that this is really affected," and this has not yet been shown. It would be quite as rational to assume that the infection finds in the tissues of the muscles and joints the nidus suitable to the development of its specific germs, just as the typhoid-fever bacillus finds its favorable nidus in the glands of the intestines, or the contagion of scarlet-fever its proper soil in the skin. As yet no micro-organism peculiar to rheumatism has been isolated, but Dr. J. N. Popoff has been experimenting in this line and has succeeded, by inoculation with the blood of a rheumatic, in obtaining micrococci, which, injected into rabbits, have resulted in producing arthritis, endo- and peri-carditis, and in the blood, synovia, and heart of the animals he has afterwards found similar micrococci. In view of the recent discoveries of some peculiar, specific micro-organism as the etiological factor in the production of so many different diseases, it seems not unreasonable to hope that some such element will yet be found to solve the perplexing question of the actual cause of rheumatism.

There remains to consider the miasmatic theory of rheumatism advanced by Thos. J. MacLagan. Upon the striking analogies existing between rheumatism and the malarial fevers, this author has built up the evidence upon which his theory is supposed to rest, and reaches the conclusion that the disease is essentially malarial in its nature. He cites as points of similarity in the two affections the following: their irregular and indefinite course; their occurrence in low-lying damp localities; their disposition to recur, one attack giving no immunity, but, on the contrary, rendering the individual more likely to suffer a recurrence; their tendency to affect some persons more than others; their non-communicability from the sick to the healthy; their tendency to produce profuse perspiration and a copious urate deposit in the urine; and their curability by simple remedies—cinchona and salicin. He argues that the plasmodium malariae is an organic para-

sitic growth, which finds in the blood the suitable nidus for its vivification and reproduction. It grows by the consumption of nitrogen and water from the blood and tissues until the nidus is exhausted, when its activity subsides, the symptoms abate, and elimination of the poison goes on. Should the nidus be renewed before the whole of the poison is eliminated, the propagation of the parasite again takes place, and a new paroxysm of fever and its accompaniments is inaugurated. By transferring the nidus from the blood to the muscles, fibrous structures, and joints, he accounts for the production of the local lesions of rheumatism in the same manner. It would seem that by this very act he at least destroys any theory of the *identity* of the two poisons of rheumatism and malaria, for to require a different nidus for the same poison is to separate the two diseases pathologically as widely as the difference which exists between malaria on the one hand, and typhoid fever, for instance, which has its particular nidus in the intestine, on the other. Clinically, rheumatism and malaria may, and do, present many striking points of similarity, but pathologically the difference is too great to permit us to regard the essential poison as malaria. Moreover, to attribute the cause of rheumatism to miasm, either the malaria germ or some other closely allied organism would make it difficult or impossible to explain the hereditary bias of the rôle played by the rheumatic diathesis in the production of the disease.

But let the poison of rheumatism be what it may, from this brief abstract of the different theories advanced to explain the true nature of the rheumatic poison, it is evident that no one of them satisfactorily accounts for all the phenomena of the disease. It seems not improbable that some bacillus or micrococcus or germ will yet be discovered as an invariable accompaniment of rheumatism. The same uncertainty and doubt that surround some such probable factor in the etiology of the disease at one time surrounded the causation of pneumonia, before the discovery of the pneumococcus. But let the poison of rheumatism be what it may, an infection or miasm, lactic or uric acid, certain

nerve conditions, or a combination of more than one of these conditions, or what not, it does not affect all alike and the disease will not develop unless it find in the individual the conditions which favor its development. This leads us to the question—what are these conditions? Probably first in importance stands heredity. This has been shown to exist in about 30 per cent. of cases, *i. e.*, nearly one in every three has had one or both parents affected by rheumatism. Some authorities assert that the heredity bias may be so great as, *per se*, to induce the case, but it is generally acknowledged that only a *tendency* is transmitted, and that certain accessory exciting causes are necessary to develop an attack. In this it resembles phthisis, gout, and other hereditary diseases. In what this tendency consists we are ignorant. We can only say that there exists in the muscles and fibrous tissues of such a rheumatic subject a certain something which forms a favorable nidus for the propagation of the rheumatic poison.

The influence of *age* is a very potent factor among the predisposing causes of rheumatism. The disease is excessively rare in sucklings, and the percentage is small up to the age of fifteen. The next decade (15–25) furnishes the greatest number of cases, after which it rapidly diminishes until the age of forty-five, when the percentage again becomes small and practically disappears at sixty. In an analysis of 365 cases by Pye-Smith, in which the attack was primary, 6 per cent. occurred between 5 and 10 years of age; 49 per cent. between 11 and 20; 32.3 per cent. between 21 and 30; 9.5 per cent. between 31 and 40; 2.2 per cent. between 41 and 50; 1.1 per cent. between 51 and 60.

As a rule, the earlier the attack the greater its severity, the more likely its recurrence, and the greater the probability of cardiac complications. In its relation to age we thus find that rheumatism, which is a disease chiefly affecting the muscular, fibrous, and serous tissues of the motor apparatus of the body, occurs at that period of life which represents the highest functional activity of those tissues which are concerned in active movements. The same period calls also for increased force and activity of the heart's action and accounts

for its being so commonly involved in the disease. A high grade of muscular activity thus favors any predisposition to rheumatism, as also appears from what has been said regarding the theories of the disease.

Undoubtedly it is the greater muscular activity which their occupations demand that renders the disease more common in adult males than females, while in childhood the proportion is more nearly equal or is even slightly higher in the female sex.

Occupations which involve fatigue and great bodily exertion, with free perspiration, and especially if the patient be exposed to sudden chilling of the surface, are the most prolific causes of rheumatism, accounting for about 55 per cent. of all cases. This explains its frequency amongst laborers, soldiers, sailors, bakers, smiths, washerwomen, cooks, and domestics.

It is held that prolonged dwelling in cold, damp apartments will gradually develop a tendency to the disease, even if it has not been inherited.

The effect of season and temperature in producing rheumatism is not very marked. It is perhaps a little more common in the later winter and spring months and when the mean temperature is below the average, but even this varies in different places and at different times in the same place. At times it seems epidemic.

As to climate it is especially prevalent in the temperate zone, being rare in the polar regions and in the hot climates, unless, perhaps, in Egypt and the East Indies.

A predisposition is manifested where the fibrous structures or the joints have been weakened or impaired by previous attacks of the disease, or where they have formerly suffered from local injury of any sort which has diminished their vitality.

Finally, any condition which lowers bodily resistance may act as a predisposing cause of rheumatism. In this category are included fatigue, mental depression, prolonged lactation, loss of blood, anæmia, post-febrile conditions, cachexiæ, and many diseases, notably scarlet-fever, dengue, dysentery,

gonorrhœa, puerperal fever, and pyæmia—the last three appearing at times to develop the true rheumatic tendency, although in most cases the lesions they produce in joints and fibrous structures are undoubtedly dependent upon their own specific poison.

To sum up, we have in acute articular rheumatism an affection of muscles and the fibrous tissues and joints of the body. Its essential feature is an excess of the metabolic products of those tissues. This excess results, first, from defective elimination by the various emunctories of the body, but especially the skin; secondly, from any cause producing deficient oxidation, which includes fatigue, physical depression, and all conditions which induce a depreciated blood state and thus lower the oxidizing power of that fluid; thirdly, from altered or impaired states of the nervous system, which presides over the nutrition of the affected parts, and by which vaso-motor disturbance is created; fourthly, from impaired vitality of the parts themselves, which serves to keep up the formation of metabolic products and hinder repair; fifthly, from the inflammation incident to the attack of rheumatism.

These various processes are capable of complete resolution, or there may exist in the affected parts such a grade of inflammatory action as will result in permanent change in their texture and impairment of their functions. The consideration of these residual effects of rheumatism has been assigned to others who are to take part in this discussion.

Looking at rheumatism from an insurance standpoint, the inferences to be drawn from a consideration of its etiology and pathology are:

1. If the disease has occurred in the ancestry and not in the applicant it need not be considered, for heredity can only be traced in about 30 per cent. of the cases anyhow; and if a parent has had rheumatism, it by no means follows his child must suffer from it. On the other hand, if such an applicant has himself had an attack already, the probability of recurrence is thereby greatly enhanced.

2. As a rule, the earlier the age at which a *primary* attack occurs, the greater the likelihood of repeated attacks, the

greater their severity, and the greater the probability of cardiac complications. The later the age, the less the danger to be apprehended from the consequences which the disease engenders.

3. Occupations calling for great muscular exertion, with consequent fatigue and free perspiration, and particularly where the applicant is exposed to sudden chilling, produce more than half the cases, and if he has already had an attack, persistence in such occupation greatly increases the risk.

4. Conditions of living which favor a lowering of tone of the nervous system, or produce a uric-acid diathesis, or serve to enfeeble the muscular system, increase the susceptibility of the individual and augment the chances of recurrence. So, too, with diseases which lower bodily resistance.

5. A combination of two or more of these elements just so far increases the probability of recurrence and impairs a risk in the same proportion.

These influences upon the desirability of a risk we are bound to consider independently of those which arise from the *residual* effects of rheumatism, which are *far more important*, but which are outside of the scope of the part assigned me in this discussion.

Dr. J. L. Davis then read a paper on

THE EXPERIENCE OF THE UNION CENTRAL LIFE INSURANCE COMPANY WITH FEMALE RISKS.

The Union Central Life Insurance Company began business in 1867, thirty-three years ago; and at its very beginning, partly through adoption from two other companies and partly through the natural choice and gallantry of its early management, a large number of women risks appeared on the books.

For five or six years the little company drifted along complacently until the officers suddenly were startled by a

number of deaths among the women policy-holders, which at that age of the company amounted to serious financial loss.

At once the directors adopted practically a quarantine against the dangerous sex, which was as wide-reaching as it was illogical.

The company in its earlier years issued largely a joint-life policy, covering husband and wife; and as a number of these losses were upon women thus insured, it is not surprising that the gaunt nightmare of moral hazard and speculative insurance terrified the directors. All married women were looked upon with suspicion; all single women were already condemned. All were doomed to early death; either from puerperal conditions before forty or from "change of life" after, unless, of course, they were predestined to be made way with by husbands or other designing beneficiaries.

Hence, for several years no self-respecting agent would dare to submit a woman's application.

However, with lapse of time, competition increased, braver and more importunate agents joined our ranks, we were persuaded to let down some of the highest bars, and a gradually increasing number of women was accepted.

Seven years ago, with the hope of getting a satisfactory and reliable judgment on the matter of female risks, I wrote to the leading companies of the United States and Canada for their ruling.

The replies indicated that while most companies accepted women, it was the almost unanimous opinion that they were less desirable than male risks. (I may state in parentheses that since that time, seven years ago, some companies have made their ruling with regard to women more favorable.)

Basing our action largely upon the summary of opinions received from these leading companies, we agreed to issue insurance to women at the same rate as to men upon all participating plans; upon stock or term insurance an extra rate of \$5 per \$1000 was charged. We further limited the amount upon one life to \$5000; our limit for men is \$25,000.

This is our rule to-day with women.

For some months past I have been tabulating the com-

pany's experience with women risks and will present briefly for your consideration some data bearing on their mortality.

For the thirty-three years of the company's existence, ending with March 1, 1900, we issued a total of 204,014 policies; of this number there were issued on women's lives 10,423—being a fraction over 5 per cent. of all.

On the other hand, the company suffered a total loss of 4273 individual deaths; of which number 395 were deaths of women—something over 9 per cent. of all deaths.

That is, considering only individuals, not amounts, women furnished 5 per cent. of our risks, but 9 per cent. of our losses.

Or, expressed in another way, for every 1000 men dying, 1891 women died.

This is certainly an unfavorable showing; but I believe when amounts and not individuals are considered the result will be somewhat more satisfactory.

The causes of death may be grouped as follows:

1. Zymotic disease.....	45
2. Constitutional disease.....	121
3. Nervous system.....	37
4. Circulatory system.....	32
5. Respiratory system.....	43
6. Digestive system.....	47
7. Urinary system.....	12
8. Violence.....	7
9. Suicide.....	3
10. Reproductive system.....	32
11. Unclassified.....	15
Total.....	395

I call attention to the unfortunate fact that there were 68 cases of consumption, being 17 per cent., 39 cases of cancer or tumor, being 10 per cent., and 32 cases, or 9 per cent., were diseases of the reproductive system.

These percentages are strikingly unfavorable. What explanation can be given? The most careful study of the cases fails to involve any special locality or agency or individual examiners. They are fairly well distributed over all terri-

tories; and only in two or three instances have we reason to suspect fraud or false answers in the examiners' reports.

In the mortality from puerperal conditions the figures show a proportionately larger death-rate in the earlier years of the company—say thirty years ago—than in recent years. One element which has made the later mortality more favorable is the advance in the science of midwifery in a generation.

A more important factor I think is our present rule of postponing pregnant women and those recently married until after first parturition.

With the death loss from consumption and cancer, however, we have not been able to improve our unfavorable record with our added years of experience.

With these diseases there is always the difficulty of early detection and diagnosis, even in men; in women applicants the difficulty increases.

In reviewing our losses from these two causes, it has seemed to me in many cases the incipient disease would have been discovered by an ordinarily careful examination—such, in fact, as male applicants usually undergo.

I am convinced that the physical examination of women ordinarily is careless and superficial. This perfunctory performance cannot reveal incipient or latent lung disease; nor, of course, any disorder of the pelvic organs.

Hence, it is an easy matter for a woman whose vitality is impaired to pass the average examiner and get a policy. Whether this is obtained innocently or through conscious fraud, the result to the company is unhappily the same.

At this time I recall but one case in which I was sure the woman knew she was in bad health, and went deliberately about getting insurance, adroitly deceiving the examiner with false statements. In this case a simple pelvic examination would have shown advanced malignant disease.

I personally believe that it is rarely the case that a woman applicant attempts to deceive the examiner. But I am equally sure their answers often do deceive him and are utterly false. I think she is the innocent victim of ignorance;

she does not knowingly and intentionally make any wrong statements. In a general way, women know only vaguely what their physical condition is. They think a certain amount of ill-feeling, aches, and pains belong to the sex. Few of them habitually have the freedom from ill-feeling which most men enjoy. If a man is sick he is always very sick—an irritable and irritating martyr. He is not schooled in suffering; he does not bear his fate patiently; he is petulant, clamorous, obnoxious. Only a few of us are not.

On the other hand, woman through generations of inheritance suffers in silence most of her life through. She faithfully believes she must suffer more or less. She attends conscientiously to her domestic and social duties day after day, not minding the headache, or the backache, or the little fever in the afternoon, or the pain down in the left side. So what can she say to the examiner except that she is in good health? The wise doctor knows that the information he wants cannot be got by the ordinary formal questions; incidentally, through a conversation more or less social and familiar, he draws his conclusions and can report accurately the woman's conditions. But such examiners are the few, the extraordinary.

To return to figures, it may be stated the average duration of the policies of those who died was 7.43 years.

The average age of those dying with consumption was 32 years; of cancer, 41 years; of disease of the reproductive system was 31 years.

The mortality for those of same age at entry was as follows:

For those entering under	Am. Exper. Table.	Compared with Am. Mort. Table.
20 was 13 per 1000.....	7.63	1.70
20 to 24 was 22 per 1000.....	7.91	2.78
25 to 29 was 28 per 1000.....	8.20	3.41
30 to 34 was 30 per 1000.....	8.63	3.47
35 to 39 was 37 per 1000.....	9.27	3.99
40 to 44 was 42 per 1000.....	10.31	4.07
45 to 49 was 64 per 1000.....	12.11	5.28
50 to 54 was 61 per 1000.....	16.59	3.88
55 to 59 was 88 per 1000.....	21.65	4.06
Over 60 was 180 per 1000.....	63.00	3.00

These figures show a death-rate, varying with different ages, which is from 170 per cent. to over 500 per cent. of the American Table. While the rate was high for those insuring under 20, it grew higher in regular gradations with each advanced age, until among those insuring late in life our record completely distanced the table. For the decade between 50 and 60 our record is not quite as bad as for that period immediately before or for those insuring later than age 60.

I have but one comfort in presenting these data and that is the knowledge that our female death-rate now is not so unfavorable as it formerly was. There is also a pleasure in knowing that more than 95 per cent. of our policy-holders to-day are men, and that our company's total mortality is exceedingly favorable, being last year but 56 per cent. of the American Table.

The discussion of Dr. Davis's paper was participated in by Drs. Homans, Fisher, Wilkins, Woolverton, Morgan, Thorburn, Devendorf, Hamill, and Tabb. Dr. Davis closed the discussion.

The meeting then adjourned.

SECOND DAY.

Dr. Oliver P. Rex made some remarks on the Rheumatic Diathesis. Dr. Edward W. Lambert spoke upon the Etiology and Pathology of Gout.

A paper entitled "The Gouty Diathesis: its Symptoms and its Prognosis," was read by Dr. Albert Wood.

This was followed by a paper, "The Sequelæ of Rheumatism," by Dr. William D. Morgan.

AFTERNOON SESSION.

On reassembling at 2 P.M., the tellers, Drs. Root and Willard, who had meanwhile received and counted the ballots which had been cast in accordance with the plan adopted by the Association at the present meeting, announced the election of the following officers:

PRESIDENT.

DR. GEORGE R. SHEPHERD.

1ST VICE-PRESIDENT.

DR. EDWARD H. HAMILL.

2D VICE-PRESIDENT.

DR. MORRIS L. KING.

SECRETARY.

DR. BRANDRETH SYMONDS.

TREASURER.

DR. FRANK S. GRANT.

EXECUTIVE COMMITTEE.

DR. EDWARD CURTIS.

DR. OSCAR H. ROGERS.

DR. GRANVILLE M. WHITE.

On motion, duly seconded, the thanks of the Association were tendered to Dr. Rogers, the retiring Secretary, for his long and faithful service to the Association.

Dr. Marsh presented a brief sketch of the life of Dr. Gustavus S. Winston, one of the founders of the Association, and for thirty years a Medical Director of the Mutual Life Insurance Company.

The general discussion of Rheumatism and Gout was then taken up.

Dr. Grant referred to the association of the gouty vice and neurasthenia. This type, in his opinion, possessed considerable longevity, the impairment was slight, much less than in other types of the gouty diathesis.

Dr. Rogers asked to what extent are lives impaired by these diseases? He thought that rheumatism, unless it had produced endocarditis or some other lesion, was of minor importance. Gout, on the other hand, was always a serious impairment, and high-rate plans of insurance were insufficient to cover the hazard, for the reason that they were impaired from the start.

Dr. Wilkins called attention to the obscurer phases of gout, as we see it in this country, and emphasized the importance of special care on the part of our examiners.

Dr. Lambert referred again to the causation of gout; uric acid, it is true, is present in the tissues, but it is there as a consequence of gout, not as a cause of it.

Dr. Shepherd, referring to the frequency of rheumatism in the personal history, called attention to the fact that in 26,000 deaths

Rheumatism was present in 6244, or 24 %.

Consumption was present in 2 %.

Cancer was present in 7 %.

Bright's disease was present in 7 %.

Apoplexy and paralysis were present in 15 %.

Heart disease was present in 10 %.

Dr. Marsh submitted some tables showing the difference in types of causes of death among those dying early or late in the insurance period.

The President appointed Drs. Frederick W. Chapin, Oscar H. Rogers, and John Homans to read papers at the next meeting.

On motion, the Secretary was instructed to convey the thanks of the Association to the Officers of the Equitable Life Assurance Society for the very great courtesy and hospitality shown during the meeting.

The meeting then adjourned.

TWELFTH ANNUAL MEETING.

The Twelfth Annual Meeting of the Association was held at the Hunt Memorial Building of the Hartford Medical Society, Hartford, Connecticut, on May 28th and 29th, 1901, President Shepherd in the chair.

There were present at some time during the sessions the following members: Drs. Charles D. Alton, Charles C. Beach, William R. Bross, Robert L. Burrage, Frederick W. Chapin, Clark W. Davis, G. Pierrepont Davis, Charles A. Devendorf, W. E. Dickerman, John W. Fisher, Frank S. Grant, J. B. Hall, Edward H. Hamill, Edgar Holden, John Homans, Abel Huntington, P. H. Ingalls, William W. Knight, R. L. Lounsberry, Elias J. Marsh, William D. Morgan, William Natress, Frank K. Paddock, W. Evelyn Porter, Edward K. Root, Gurdon W. Russell, George R. Shepherd, Brandreth Symonds, H. Cabell

Tabb, Addison S. Thayer, James Thorburn, Harry Toulmin, S. Oakley Van der Poel, Joseph H. Webb, Frank Wells, George Wilkins, Algernon Woolverton, and Albert Wood.

The following candidates were unanimously elected to membership:

Dr. William G. Richards, Mutual Life.

Dr. John Warren, Equitable Life.

Dr. W. E. Porter, Mutual Life.

Dr. C. C. Beach, Travelers.

Dr. W. W. Knight, Connecticut General.

Dr. H. S. MacLean, Life Ins. Co. of Virginia.

The minutes of the last annual meeting, together with those of the intervening meetings of the Executive Committee, were read and adopted as read.

The President then delivered his annual address, including a letter from Dr. H. Wells, Actuary of the Connecticut Mutual Life Insurance Company.

It was moved by Dr. Alton that a committee of three be appointed to consider the feasibility of putting into effect the recommendations made by the President. The motion was carried. The following were appointed as the committee: Drs. Alton, Hamill, and Fisher.

The following obituary was read by Dr. Tabb, and unanimously adopted:

Resolved, It is with deep sorrow and regret that the Association of Life Insurance Medical Directors is informed that death has again invaded our ranks, and that Dr. Ferdinand E. Chatard died at Atlantic City, October 27, 1900.

"Dr. Chatard was one of the leading physicians of his city (Baltimore), and always stood in the front rank of his profession. He was of French descent, and of a family of

physicians, his grandfather, father, and brother being Doctors of Medicine.

"He occupied many positions of eminence in addition to that of medical director of the Maryland Life Insurance Company, and was elected a member of our Association at its third annual meeting. By his amiability, uniform courtesy, and cordiality of manner he endeared himself to all who had the pleasure of his acquaintance.

"*Resolved*, In testimony of our high regard and sincere sympathy, these resolutions be recorded in our minutes, and a copy of them be sent to his bereaved family, and to the company which he so zealously, ably, and satisfactorily represented."

The Association then adjourned for a pleasant lunch at the Hartford Club, for which they were indebted to the life insurance companies of Hartford. After lunch the meeting was resumed.

An appreciative obituary of Dr. Melancthon Storrs was then read by Dr. G. P. Davis, of which the opening paragraph was as follows:

"Since our last meeting this Association has suffered the loss by death of a highly valued member, Dr. Melancthon Storrs. One of the original twenty-eight who assembled in 1889 at the Union League Club, on the invitation of the lamented Dr. Keating, Dr. Storrs always maintained a deep interest in the Association and its purposes. He attended nearly every annual meeting held since its organization, and more than anything else entertained a profound respect for its members. This was a pronounced sentiment with Dr. Storrs and he was apt to impress it upon his hearers when the Association was under discussion."

It was moved and carried unanimously that the address on Dr. Storrs be accepted and filed.

Dr. John Homans then read a paper on

THE RELATION OF SURGICAL MUTILATIONS TO
LONGEVITY.

At the first glance the subject of this paper seems one of much interest and about which much may be written. When the writer begins his task, however, he finds his subject very considerably restricted. In the library of the Surgeon-General at Washington there is nothing bearing on the question, and I find but little that has been written or published concerning the duration of life after the loss of limbs.

There is an article published in the *Medical Examiner and Practitioner* for February, 1901, by John Lincoln Porter, M.D., on "The Relation of Deformities to Life Expectancy," from which I will quote. You will see that the article refers to deformities rather more than to mutilations:

"It is impossible to make positive statements or even to deduce conclusions of value in regard to anything pertaining to life expectancy without statistics, and in looking up the influence of deformities upon the duration of life, I have found that statistics pertaining to this subject are entirely lacking. Indeed, I have been unable to find a single article or contribution on the subject, and in the complete files of the *Medical Examiner* there is no reference to deformities.

"I have been surprised at the small amount of space and attention given to the subject of deformities by our chief companies. In the printed instructions issued to agents and examiners by thirty of the largest insurance companies in this country, deformities are mentioned as influencing life expectancy by eight, while twenty-two do not refer to them at all.

"One of the most authoritative writers of the day (Senn) on surgical pathology, says: 'A person who has once been the subject of tubercular affection of a joint is always in danger of suffering from a local recurrence or tuberculosis in some other organ. . . . The spores of the bacillus

of tuberculosis may remain in a latent condition for an indefinite period of time in the cicatrized primary lesion, to become a cause of subsequent danger as soon as the local or general conditions enable them to develop and exercise their specific pathogenic properties.' "

Through the kind interest of the Surgeon-General and Assistant Surgeon-General of the United States Army, I have been referred to two of the Annual Reports of the Surgeon-General, namely, the report for the year 1892 and that for the year 1895. In these reports there is a discussion of the death-rate of men who suffered amputation during the Civil War. To these statistics I shall refer later on. It is probable that one might learn much from the records of the Pension Bureau, but they are in no such shape at the present time as to be of any value in this connection.

Let us first consider the general relations of mutilations to longevity, and later the regional mutilations, beginning with injuries to the head, next to the upper extremities, and so on down to the feet.

In general it may be said that the deprivation of any important part of the body would make a man's chance for longevity less than that of sound unamputated persons, but in many instances there might be ameliorating circumstances which would render the subjects of these mutilations apparently as good lives as most other people of the same age. And here let me say, once for all, that so far as I know there are no statistics on this subject.

Injuries to the skull.—An applicant who had suffered a fracture of the skull with loss of substance of bone, or brain, or both, would not be an average good risk; without loss of substance, and without symptoms, he would be as good a risk as anyone else. Fractures of the spine are generally fatal, and if a man should recover from such an injury I think his natural longevity would be curtailed.

Blindness.—Loss of sight from an injury would not lessen longevity as a rule, but those whose eyes have been removed on account of carcinomatous or sarcomatous growths would be likely to be short-lived. The blind, if in com-

paratively comfortable circumstances, are as long-lived as any one, so far as my experience goes. I may add that I have been the medical inspector of the Perkins Institution for the Blind for over twenty years.

Losses of the upper limbs are more important, as bearing on longevity, the nearer the amputations have been made to the thorax. A loss of a hand, *per se*, in a person able to pay a premium on life insurance, would not cause a declination, but there is in this mutilated condition, as in others, a mental depression and dissatisfaction at times, and more of a moral risk than in the unamputated. Several of my fellow-soldiers in the war of the Rebellion, who suffered amputations of various kinds and degrees, became intemperate in the use of alcohol, or morphia, and *all* of them that I recall, whether cases of excision or amputation, are now dead. Probably persons in civil life who have suffered amputations on account of injuries are better risks than those whose limbs have been removed on account of gunshot wounds; their habits are apt to be better and their injuries are less numerous, less constitutional, and more definite. A soldier may have many more bruises and injuries at the time of his accident than the man in civil life, and probably would have less property and less chance to make a living and earn money.

I should think that the loss of an arm might affect the respiratory power of the thorax in certain attitudes, and the loss of both arms might cripple the breathing capacity by depriving the subject of the ability to support and rest himself by suspension or by bearing or leaning on his arm. Of course an amputated upper extremity would cripple the mechanical powers for manual labor tremendously, and render the successful pursuit of carpentry, blacksmith work, or any trade requiring the use of the hands, impossible except to a limited extent.

Naturally a well-insured income, removing the subject above all occasion for anxiety, would induce the examiner to approve a life where the opposite conditions would cause a declination. The causes also of amputations, whether traumatic or constitutional, would influence one's judgment.

Traumatic causes would be more favorable than pathological. A man whose limb had been removed on account of a sudden injury would be a better subject than one whose limb had been removed on account of cancer, sarcoma, or tuberculosis. All of the latter should be declined, as their chance of longevity would not be so good as the average. All that has been said of the loss of the upper extremities will apply to the lower, with the additional disability of impaired power of locomotion.

"From June 17, 1870, to January 15, 1892, 10,187 former soldiers of the United States army filed claims for amputations of limbs. Five thousand and fifty-three had lost their arms and 5134 their legs. At this time an act was passed by Congress granting an artificial limb, or its commuted value, once every five years to all officers, soldiers, and seamen who had lost a limb during the war for the suppression of the Rebellion. These 10,187 cases of amputation were filed in 1870-71. In January, 1892, there were 7412 cases of amputation on the list of pensioners. During 22 years, 2756 of the cases had died, *i.e.*, 27.14 per cent. of their number.

"The death-rate of those with disabled or amputated limbs is considerably higher than it would have been if the disabled or amputated limbs had been the only results of the war service that tended to shorten life; for it must be observed that many of these men had other wounds or disabilities besides those affecting their limbs.

"In general terms, the age of those persons during the twenty years of observation covered the period of life from 30 to 50 years of age, and the average annual death-rate was for the amputated cases about 14.1 per thousand and for the others 16 per thousand living at the beginning of the period. The experience of insurance companies shows the death-rate of men between the ages of 30 and 50 to be an average of about nine per thousand annually. The increase among our pensioners to 14.1 and 16 per thousand expressed the influence of their disabilities and of the exposures associated with the incurrence of them in shortening their lives.

"These rates, large as they are, compared with the average

rate prevailing among individuals of corresponding age in civil life, apply only to a certain period of twenty years. To determine the influence of wounds and exposure in increasing the death-rate of the soldiers of the war of the Rebellion we should require to know the number of the wounded or otherwise disabled living at the close of the war and the deaths that occurred among them up to June 30, 1870, when the statistics of the operations of this office under the artificial-limb laws take them up and account for them with precision. It is not possible to obtain these data in the cases of the disabled men, but the facts concerning the amputated cases are better known.

"At the close of the war there were, according to the records of this office, 13,052 recoveries from amputation of the arm or leg such as would have entitled each to benefit under the artificial-limb law subsequently enacted; and as in 1870 only 10,187 applied for artificial limbs or commutation, it may be inferred that 2865 of those maimed soldiers had died up to that time—21.95 per cent. of their total—a much larger percentage of mortality than is shown by any of the subsequent quinquennial periods. By incorporating these figures with those previously given it is found that during the 25 years, from the close of the war to 1890, 5621 subjects of amputation died out of a total of 13,052 cases, or 431 per thousand. Dividing the quarter of a century into successive periods of five years, the deaths during the first period were 2865, or 21.95 per cent. of the total; during the second 999, or 9.81 per cent. of the survivors at the beginning of the period; during the third 557, or 6.06 per cent. of those surviving in 1875; during the fourth 583, or 6.75 per cent. of those alive in 1880; and during the fifth, 1885–90, 610, or 7.58 per cent. of those on the rolls in 1885. It is thus seen that the mortality rates of those men who were disabled during the war were very large during the early years succeeding the occurrence of their disabilities, and from what follows it may be observed that even now their annual death-rate is largely in excess of that of the average citizen.

"At the close of the war the recoveries from amputations

of the upper extremities numbered 6249. In 1870, 1193, or 19.14 per cent. of their number, may be assumed to have died, for only 5053 filed their claims for artificial arms; 557 cases, or 11.02 per cent. of those alive in 1870, died before receiving a second benefit; 268 cases, constituting 5.96 per cent. of the survivors, died after the second but before the third benefit; 293, or 6.93 per cent. of those living in 1880, died before 1885, and 305, or 7.75 per cent. of those alive in the last-mentioned year, died before the expiry of the next five years.

"The recoveries from amputation of the lower extremity numbered 6703 at the close of the war; but as only 5134 reported for artificial limbs, 1,569, or 23.41 per cent., may be assumed to have died. The deaths and the percentages constituted by them for the next four quinquennial periods were as follows: 1870-75, 442 and 8.61; 1875-80, 289 and 6.16; 1880-85, 290 and 6.59; 1885-90, 305 and 7.41.

"The death-rate of those who suffered amputation of the leg was greater than that of the cases of amputated arm during the early period succeeding the war, but during the later years the rates of the two sets of cases have not varied much.

"Since each of the 21,102 persons on the rolls has received an artificial limb, or its commutation, one or more times, the number of certificates issued by this office has amounted to 68,456—40,959 in cases of amputation and 27,497 in cases of loss of use of limbs—the relative percentage being 59.83 and 40.17.

"The certificates entitling to benefit in cases of amputated upper extremities number 20,185, of which 287 were for limbs in kind and 19,898 for commutation. With the artificial limb furnished in kind the law provides for the free transportation of the pensioner to and from the place of manufacture, thus affording an opportunity to those who had settled in the West to have a trip to New York, Philadelphia, or other Eastern city, which might be utilized in seeing old friends and relatives. Notwithstanding this inducement to be fitted with the artificial arm, 98.6 per cent. of the arms which might have been called for were commuted. Only a

little over one man in a hundred of these armless men elected to receive an arm. Its usefulness is regarded as nil, and although some may claim it to be an ornamental addition to a maimed individual, the man with a war record generally prefers his empty sleeve. The records show also that few of those who were furnished with an artificial arm called for a renewal of it at a subsequent period.

"The artificial leg is shown by the statistics to be an appliance of much more practical value than the arm. Of 20,214 certificates issued in cases of loss of the leg the limb in kind was called for in 4421, the money equivalent in 15,793, or in 21.9 and 78.1 per cent. respectively. At first sight it would seem from these statistics that the allowance of an artificial leg once every five years is largely in excess of the needs of the maimed soldiers, since so many elected to receive the money value rather than the limb; but it must be remembered that in many cases, on account of conditions of the stump, a leg cannot be worn, and that unfortunately the financial circumstances of many of the old soldiers are such as to prevent them from accepting the expensive luxury of an artificial leg when its acceptance would cause them the loss of the \$75 which they would otherwise obtain. Although the names of 5134 men crippled by amputation are on the rolls, only 4421 artificial legs were used during the whole period of twenty years.

"In amputations of the foot 560 certificates were issued, 24 for the artificial foot and 536 for its money value, \$50—4.3 and 95.7 per cent. respectively.

"There were 16,410 certificates issued in cases of loss of use of the arm. Few of these were susceptible of benefit by surgical apparatus, only 34 such having been recorded in the twenty years. Commutation was paid in 16,376 cases.

"Similarly in loss of use of the leg, benefit was derived from apparatus in only 49 cases while commutation was paid in 11,087."

From the Surgeon-General's Report for 1895, I learn that there were claims allowed for amputation from June 17, 1870, to June 30, 1895, amounting to 10,427. Of these 3073 had

died, or 29.47 per cent., 294.70 per 1000. These deaths extended over a period of 25 years, and the pensioners were all probably at least 30 years old or older when their pensions were granted. This mortality is at least three times as great as that in the same number of insured unimpaired lives between the ages thirty and fifty. I have quoted at length nearly all that is said on this subject by our Surgeon-General, and I have no doubt that one who is accustomed to dealing with statistics, like our fellow-member, Dr. Marsh, for instance, will be able to learn much more from these figures than I have told you. At any rate, this information shows us that, as a class, persons with amputated limbs are not so long-lived as those unamutilated, and that each case must be decided individually.

It seems unnecessary for me to enumerate the various disabilities and deprivations caused by loss of limbs, and my task is only to record the effect on the longevity of the mutilated individuals, as far as I have been able to ascertain it.

In regard to mutilations of the thorax and its contents.—A successful recovery from acute empyema after the removal of small portions of one or two ribs need not necessarily shorten a man's life or deprive him of insurance, if the lung has become well expanded and the functions are well performed. Injuries to the heart, when recovered from, would cause these sufferers to be declined as not having a normal viability.

BELOW THE DIAPHRAGM.

Abdominal mutilations.—It may safely be said that persons whose stomach, spleen, liver, or kidneys have been meddled with surgically, or removed, either surgically or by accident, do not promise a longevity which would justify their insurance. In regard to cases of recovery after incision of the gall-bladder and removal of calculi, not connected with cancer of the liver, I think they would be good risks if we could eliminate the possible recurrence and reformation of the stones; but this we cannot do, and it is reasonable to assume that gall-bladders in which gall-stones

have once formed are more prone to such an occurrence than perfectly healthy gall-bladders in which no stones have ever formed.

Indeed, in my own experience I have seen stones form in a gall-bladder from which I had removed some two hundred gall-stones eighteen months before. Again, all the symptoms of recurrent gall-stones may recur and yet on opening the gall-bladder we find none. Such a case has occurred in my own experience. I think that this possible recurrence ought to exclude from life insurance persons who have had cholecystotomy successfully performed.

Renal mutilations.—A person who has had a diseased kidney removed may live to be very old, but the possibility of this depends on the reasons for which the kidney was removed, and on the amount of work the remaining kidney can perform. The removal of a large suppurating kidney full of pus and calculi is a great relief to the system, and if the other kidney is sound it is probable that the individual will get along as well as the majority of persons with two sound kidneys; but usually, in cases of severe pyelitis and cystitis, both kidneys are diseased and only the worst one is removed, and I should say that as a rule the person who had recovered after the removal of a kidney and is well and strong has had enough good fortune and ought to be contented to get along without life insurance. At the same time, I am at present considering the application of a strong, healthy man who has had a kidney removed on account of cystic disease. But most suppurating kidneys are tuberculous.

Mutilation of the bowels.—In regard to recoveries after excisions of small portions of the bowels after injuries, or gangrenous herniæ, I should say that longevity was likely to be as great in them as in persons whose bowels had not been meddled with. Persons who have recovered from operations for the removal of the appendix have, I think, as great likelihood of living to be old as those in whom this operation has not been performed. Where bowel has been excised for the removal of new growths, the probability of recurrence is so great that such persons are not likely to be long-lived, yet

all malignant diseases of the alimentary canal are apt to be slow in their growth and recurrence.

Ovarian and uterine mutilations.—In regard to the longevity of women after the removal of ovarian or uterine tumors, it is impossible to speak with accuracy. Provided the tumors were not malignant and the women have made rapid and perfect recoveries, I believe their longevity is up to the average. Ovarian tumors, however, on their removal are not commonly studied histologically and many that are adenocarcinomata, *i.e.*, glandular-cancers, are not recognized as such and the real nature of the disease is only revealed by a recurrence. Probably most surgeons who perform ovariectomy are satisfied with the recovery of the patient and do not have the tumor examined pathologically and histologically. In 10 per cent. of my cases of ovariectomy, in which so far as I remember the cysts looked, if I may say so, healthy, smooth, and shining, cancer of the abdominal scar or of some of the internal organs has been fatal within a year or two of the operation; and even in several cases where the original tumor has been reported by competent observers to be a simple cyst-adenoma, there has been a fatal development of cancer. The longevity of a portion of those women who recover from ovariectomy is not so great as the average of healthy women, and so I think that applicants who have recovered from ovariectomy should be rejected unless the pathological and histological history are well known and are perfectly satisfactory, as no one can tell which of them will die of subsequent malignant disease, or of intestinal obstruction, or suffer from hernia. In structure the walls of ovarian cysts are very like those of cancers and it would be speculative to insure such cases.

In regard to those who recover after hysterectomy for the removal of fibroids the probability of longevity is greater than in those who recover after ovariectomy, because these tumors are almost never malignant, and neither the scar of the abdominal incision nor the internal organs are likely to be infected with cancer. Yet occasionally there is cancerous development in a fibroid uterus. I think I have seen three

such cases in two hundred abdominal hysterectomies, and it does not seem to me that persons who have suffered such extensive mutilations as abdominal section and the removal of the uterus and ovaries can be considered quite as good subjects for longevity as healthy persons of the same age who have suffered no such mutilation.

Then, again, all women who have had abdominal section performed are liable to ventral hernia, and this may become strangulated at any time.

There is very little said in the insurance manuals on this subject. In these books one is advised to reject cases of amputation at the shoulder or hip, and generally cases of amputation above the knee, and to accept those with other amputations of the upper or lower extremity if the amputation was not done for disease and a well-fitting artificial limb is worn.

Perhaps this matter is as well summed up by Brinton, who lectured on Examinations for Life Insurance in England more than thirty years ago, as by any one since his time. Brinton says:

“The effect of the loss of a limb, or a special sense, it is rarely necessary to estimate. Amputation of a limb for disease is said to confer an increased risk of visceral—especially of pulmonary—disease. But here the previous malady would itself enter into our calculations, as well as the present health (including any appearances of latent mischief) of the person examined. Amputation for injury or accident is also said to be often followed by a plethoric state, and a tendency to corpulence, that are attended with increased risk to the constitution. These, however, would also be visible facts, that could scarcely escape notice.

“And in respect to these mutilations, as well as to complete blindness, deafness, and the like, we may sum up their other chief indirect effects in the general statement that whatever interferes with the exercise natural to a healthy individual, or deprives him of the proper guards against accident which nature furnishes, of course increases his risk of disease and injury respectively. But how far it will do so

must be judged of from the details of each case; in other words, the habits and circumstances of the individual. In the affluent classes, the care and attention that wealth can secure often reduce the influence of such accidents to a minimum that may practically be overlooked altogether."

In conclusion I should say that as a class persons who have suffered amputations or other mutilations are not so likely to be long-lived as those who are healthy and have not been mutilated, but by careful selection many of the mutilated persons might be picked out who would be good subjects for life insurance.

This paper was discussed by Dr. Toulmin, who said that the accident hazard in the totally blind was small, while in the totally deaf it was considerable. Further discussion followed by Drs. Frank Wells, Devendorf, Paddock, Wood, Thorburn, and Shepherd, to which Dr. Homans replied.

It was moved by Dr. Symonds that—

"The committee of the Actuarial Society which is now investigating the experience of the companies in regard to certain impairments be requested to include in their lists the matter of amputations of the lower extremities."

The motion was carried.

The pamphlet "Indications for Selection" was then taken up for discussion. The originator, Dr. Hamill, explained that the object was to obtain, after full discussion, an authoritative expression of the opinion of the Association, though it was not to be considered that this opinion would be binding upon individual members.

The Association adjourned for a drive around the city and through the parks, finally reaching the

Hartford Golf Club at 7.30 P.M. There the members had a most delightful supper at the invitation of the life insurance companies of Hartford.

SECOND DAY.

The paper on "Build as a Factor Influencing Longevity," by Dr. Oscar H. Rogers, was read by Dr. Van der Poel, in the absence of Dr. Rogers.

BUILD AS A FACTOR INFLUENCING LONGEVITY.

The difficulties of selecting out a group of lives which shall fall within the limits of the normal in all other respects save one are very great. Probably no single life has exactly the same insurance value as any other, and any group of lives however carefully selected must be composed of very good, good, moderate, fair, and border-line lives as measured by the standard used; risks shade by insensible gradations from the very good to the very doubtful, and among those which are doubtful it is difficult to decide with respect to any given case whether it shall be placed among the selected lives or excluded from them. For example, take the clerical, legal, and medical professions; I doubt very much that any member of this Association, in the course of his routine work, makes any marked distinction in his own mind between the members of these three professions, and yet we know that the mortality among the clergy is not very much more than two-thirds as great as that among physicians, and that lawyers as risks for insurance have a value about midway between the other two. We accept members of these three professions with almost equal freedom and we place them in our selected class.

I mention this simply to illustrate the difficulties which

attend medical selection and also to show that any group, however carefully selected, must contain lives whose values differ very considerably one from another.

I ask your indulgence while I briefly refer to another fact which should be had in mind in any study of this sort. I have referred to the difference which exists between members of the various professions with respect to their insurance value. No doubt all of us in our daily work accept risks from these professions as of probably equal value; but in the border-line cases we discriminate between them. We should be willing, for example, to recommend a clergyman of very slender build where a physician of the same build would be thought to fall outside the limit of our standard class. In the same way in all border-line cases when passing judgment upon them we constantly have in mind other minor factors, which we ignore in cases presenting no marked departure from the normal. In other words, among risks which are somewhat doubtful by reason of any particular factor our selection is very much more rigid with regard to all other unfavorable factors. A certain amount of overweight has been looked upon with favor, our tendency being to consider a certain degree of hyper-nutrition desirable. When, however, the overweight approaches or exceeds the limit we have fixed in our mind, we scrutinize with greater and greater care all other details of the case and exact that they shall be more and more favorable, until we find ourselves accepting risks much outside our overweight limit because all other factors are exceptionally favorable.

We must consider, then, that the groups of lives which we shall to-day discuss are made up:

1. Of material homogeneous in so far as insured lives selected as we used to select them may be considered homogeneous.

2. That these lives have been more and more rigidly selected the further they have been found to depart from the normal.

Let us now take up the study of the material we have been able to accumulate for the purposes of this paper:

OVERWEIGHTS.

This is a study of 1553 lives of persons 30 per cent. or more overweight. They were all residents of the United States or of Europe or Australia. Persons of intemperate habits, hazardous or unhealthful occupations, or of markedly unfavorable personal or family history have been excluded. They were placed on the books of the company between the years 1880 and 1890, both inclusive, and have been observed as of the anniversary 1900—a minimum possible duration of ten years and a maximum of twenty years for those risks still remaining on the company's books. Taking lapses and deaths into account, the average duration of each case is found to be $7\frac{1}{2}$ years, and the probable total years of life of the entire group of overweights is about 11,700 years.

These lives were originally selected according to the standard of build then in use in the company, which was defective in that it was too rigid at the older ages and too lenient at the younger. The selection produced under such a standard should therefore be more careful and show better results at the advanced than at the younger ages.

In remeasuring these lives I have made use of the New York Life Table, which is based, as you know, upon the data accumulated for the Association by Drs. Shepherd and Brannan. This table takes into account the important element of age, and I believe that the present study, however imperfect it may be, has the distinction of being the first in which the element of age is taken into account in determining the influence of build upon longevity.

In this group, which includes all those selected lives which were found to be at least 30 per cent. overweight, nearly half of them were between 30 per cent. and 34 per cent. (inclusive) overweight; more than a quarter fell between 35 per cent. and 39 per cent. overweight, and the remainder of them were 40 per cent. or more overweight. As to age distribution, a quarter of the total number were under 30 years of age; six tenths of them were between 30 and 44 years of age, and the remainder were 45 years of age or older.

This study has been made by lives as well as by amounts because where amounts alone are taken into account the death of a single individual insured for a large amount is sufficient to seriously vitiate the testimony of a small group, whereas in a small group the results obtained in a study by lives may be expected to show a smaller probable error. The two methods are apt, therefore, to check one another to a certain extent and where there is found a substantial agreement we may feel doubly confident of the accuracy of our findings.

Taking the entire group of overweights as a whole we find that the mortality by *amounts* is *39 per cent.* in excess of the normal—a result similar to that obtained by Dr. Fisher in his excellent paper of some years ago.

By *lives* we find:

Total number of lives exposed.....	1553
Actual mortality.....	140
Expected mortality.....	104
Number of deaths in excess of the normal.....	36

or about $34\frac{1}{2}$ *per cent.* in excess of the normal.

The two results support one another in a most striking manner and compel us to conclude that among heavy-weights the mortality is high.

The next question which presents itself is the influence of the degree of overweight, and to answer this the entire group of overweights was subdivided into three groups according to the degree of overweight,—all those lives which were found to be between 30 and 34 per cent. overweight being placed in one group, those lives which were 35 to 39 per cent., inclusive, overweight were placed in a second group, and those which were 40 per cent. or more overweight were placed in a third group. The results obtained from this study, by lives and by amounts, show mortalities in excess of the normal as follows:

	30-34 %	35-39 %	40 % and over.
By amounts.....	60 %	27 %	14 %
By lives.....	49 %	20½ %	31 %

If our analysis were to stop here we should be obliged to conclude that our group of moderate overweights (30-34 per cent.) was the least desirable group, and that the heavier the risks became the more nearly they approached the normal in value, but we can hardly accept the idea that the value of a risk improves in proportion as the overweight increases. On the contrary, we have abundant reason to believe that after a risk has passed a certain degree of overweight its value rapidly decreases. Undoubtedly one cause for the lower mortality among the excessive overweights is the very careful selection which must have been practised among them; yet this can hardly explain all of the difference, and we must turn to another important factor to see if it may contribute to produce this anomalous result. I refer to the factor, age.

Arranging the three groups according to their age distribution we find the following:

Age.	30-34 %	35-39 %	40 % and over.
Under 30.....	17 %	28 %	30 %
30-45.....	65 %	56 %	60 %
45 and over.....	18 %	16 %	10 %

from which it will be seen that there is a much larger proportionate number of elderly persons in group 30-34 overweight and a very much smaller proportionate number in the heavy-weight group—40 per cent. and over,—while the number of persons in the middle-aged group (30 to 45) is substantially the same. It seems probable, therefore, that the discrepant results shown in the first table may be due to the differences in age distribution in the several groups.

The number of deaths in each of the three build groups when subdivided according to age gives us so small a number in each group that any study of them must prove of doubtful value; but as the question of the influence of age upon the mortality of overweights seemed an important one, the three age groups were consolidated and the mortality tabulated in each period according to attained ages. For example, a group of lives between 20 and 24 years of age at entry will at the end of five years be 25 to 29 years of age; at the end of

ten years they will be between 30 and 34 years of age, and so on. If we wish to know the influence of age among overweights we must study them not as if those which enter at age 20 always remain in that group, but we must recognize that as time passes they fall successively into the succeeding five-year groups. At the end of twenty years they are studied as of age 40-45, and so on. Pursuing this method and arranging results according to *age periods*, we get the following:

20-29	30-39	40-49	50 and over.
107%	92%	146%	175%

a practically uniform rising mortality, beginning at the normal at the earlier ages and extending to a very high mortality during the later years of life.

The same facts studied by *amounts* show:

20-29	30-39	40-49	50-59
Gain of	Loss of	Loss of	Loss of
34%	1%	30%	85%

Comparing these two studies we see that moderate overweights, if reasonably carefully selected, may be expected to show a normal mortality up to about age 40, after which they rapidly deteriorate in value until at age 65 the mortality by either lives or amounts will probably be 75 per cent. in excess of the normal. This statement applies especially to persons about 35 per cent. overweight, and we should expect persons of heavier build to show a proportionately worse mortality than this.

The number of cases involved in this study has been too small to give us any very definite results by territorial distribution. There is undoubtedly a higher mortality in the Southern States than in the Northern, but it is impossible to be more definite than this.

UNDERWEIGHTS.

Between the years 1880 and 1890, inclusive, there were insured in the New York Life within the territorial limits.

already described 9006 persons 13 per cent. or more underweight. These have been studied as of the anniversary 1900. At the time of their selection the company's standard took no account of the age element, but permitted a free selection up to 20 per cent. below its average. When measured by our present standard we find that our old standard admitted persons only 15 per cent. underweight at the earlier ages, while at age 60 the limit was about 25 per cent. underweight. There was, however, a disposition to admit persons at the younger ages much more freely than at the older, provided there was no suspicion of tuberculosis in the family. These two tendencies no doubt offset one another to a considerable extent, but so far as I am able to ascertain the net result probably was to make the selection rather more careful at the earlier than at the later years of life. The lives were normal in all respects save in the matter of build, and what has already been said of overweights regarding other factors than build applies equally to these underweights. The importance of the age element was found in our overweight study to be so great that it was thought best to at once arrange the data according to attained age in which, as will be remembered, persons entering as of age 20 to 24 at the end of five years pass to the group 25 to 29, at the end of ten years to the group 30 to 34, and so on.

First, taking the group as a whole, there was found by *lives* a gain of about 10 per cent., and by *amounts* a gain of about 12 per cent. Dividing the risks into *build* groups according to the degree of underweight we get the following:

	13-14%	15-19%	20-24%	25% and more underweight.
	Loss of	Gain of	Gain of	Loss of
By lives.....	15%	18%	23%	17%
By amounts...	7%	12%	11%	5½%

In the last group—25 per cent. and more—the lives involved were so few as to make the observation of little practical value.

Analyzing each of these groups separately as to age we get:

	Age 20-29	Age 30-39	Age 40-49	Age 50-59	Age 60 and over.
13 and 14%.....	190%	120%	100%	100%	80%
15 and 19%.....	112%	116%	75%	55%	55%
20% and more.....	80%	80%	80%	70%	70%

In making an effort to draw some practical inferences from these results we should remember the fact which I referred to at the beginning of this paper, viz., that among risks which are somewhat doubtful as to any particular factor our selection is very much more rigid with regard to all other unfavorable factors. No doubt the cases which make up the first of these groups, viz., those 13 and 14 per cent. underweight, were selected with considerable freedom as to other factors than build, but in the last two groups this selection must have been practised with greater and greater care the more slender the risks were found to be. We may say, then, with regard to the groups 15-19 per cent. and 20 per cent. and more underweight that most of the cases included in them were very carefully selected and that aside from their very slender build they were exceptionally fine risks. Consolidating these last two groups, viz., all persons 15 per cent. or more underweight, into a single group we get a mortality of:

Age 20-29	Age 30-39	Age 40-49	Age 50-59	Age 60 and over.
110%	110%	80%	65%	65%

A careful inspection of the risks included in this group has satisfied me that if they were persons of average build the mortality among them would have been very low—I should say not over 65-70 per cent. of the normal—and my conclusion is that the mortality among underweight lives at the earlier ages is probably nearly twice as great as at the later ages of life, although by reason of the difference in the mental attitude of the selector it is impossible to demonstrate that fact.

Turning back to the results obtained in the group 13-14 per cent. underweight, in which the selection must have been much less rigid than among the lives of very slender build, we get a mortality in the earlier years of 190 per cent., and in the later years of only about 80 per cent. We therefore have two groups of lives—a very rigidly selected group and a group in which the selection was probably only moderately rigid—in which the mortality in the earlier years is high and in the later years low. I think we are justified, then, in drawing the conclusion that the value of underweight risks depends very largely upon the age of the applicant at the time of taking out the insurance; and, although the present study does not directly justify the conclusion, I believe that we may infer, taking all the factors into account, that there probably is a direct relation between the degree of underweight and the mortality.

Summing up this study both with regard to overweights and underweights we may say:

1. That among life insurance risks the hazard increases in proportion to the degree of over- or under-weight.
2. That whereas among overweights the mortality to be expected increases with the increased age of the applicant, among underweights the mortality decreases with advancing years.

This paper was discussed by Drs. Holden, Shepherd, Fisher, and Marsh.

Dr. Hamill showed a chart prepared by the statistician of the Prudential, which demonstrated the influence of build in the following classes of death-causes: tuberculosis, accidents, circulatory, renal, nervous, respiratory, and digestive.

The discussion was closed by Dr. Van der Poel.

It was moved by Dr. Holden that Dr. Rogers be requested to have the article published after he has revised it. The motion was carried.

The tellers, Drs. Alton and Morgan, reported that the following officers had been elected:

PRESIDENT.

DR. GEORGE R. SHEPHERD.

1ST VICE-PRESIDENT.

DR. EDWARD H. HAMILL.

2D VICE-PRESIDENT.

DR. MORRIS L. KING.

SECRETARY.

DR. BRANDRETH SYMONDS.

TREASURER.

DR. FRANK S. GRANT.

EXECUTIVE COMMITTEE.

DR. EDWARD CURTIS.

DR. OSCAR H. ROGERS.

DR. GRANVILLE M. WHITE.

The discussion of "Indications for Selection" was resumed on the topic "Appendicitis."

The topic "Albuminuria" was then opened for discussion, but was not completed on account of adjournment for lunch. This was held, by invitation of the life insurance companies of Hartford, at the Hartford Club. After lunch Dr. Hamill stated

that he was unable to remain longer, owing to imperative engagements, and it was then moved by Dr. Wood that further discussion on "Indications for Selection" be postponed. The motion was carried.

It was moved by Dr. Wood, and carried, that the date of this discussion be referred to the Executive Committee.

The following essayists were appointed for the next annual meeting: Drs. Grant, Burrage, and John L. Davis.

The following resolution was moved by Dr. Grant and unanimously carried:

"Resolved, That the Association of Life Insurance Medical Directors desires to express to the life insurance companies of Hartford, and to the Hartford Club, its appreciation of the splendid reception which has been tendered its members at the annual meeting held in Hartford."

The meeting then adjourned.

In the evening the annual dinner was held at the Hartford Club and was a most delightful occasion. There were no speeches, though everybody spoke. The members present were Drs. Root, Morgan, Ingalls, Fair, Grant, Dickerman, Alton, Knight, G. P. Davis, Fred. W. Chapin, Marsh, Russell, Shepherd, Tabb, Fisher, Burrage, Davis, C. W. Hall, Porter, Beach, and Symonds.

THIRTEENTH ANNUAL MEETING.

The Thirteenth Annual Meeting of the Association was held at the office of the Metropolitan Life Insurance Co., on June 3d and 4th, 1902, the President, Dr. Shepherd, in the chair. The following members were present at some time during the sessions: Drs. William R. Bross, Robert L. Burrage, Frederick W. Chapin, Thomas C. Craig, Edward Curtis, G. Pierrepont Davis, John L. Davis, Z. Taylor Emery, John W. Fisher, E. L. Fisk, Frank S. Grant, Edward H. Hamill, Edgar Holden, John Homans, Morris L. King, A. S. Knight, W. W. Knight, R. L. Lounsberry, William S. Manners, E. J. Marsh, W. D. Morgan, John P. Munn, William Natress, Edwin M. Northcott, W. L. Paddock, W. E. Porter, Oscar H. Rogers, Edward K. Root, H. C. Scadding, Elmer A. Scott, George R. Shepherd, P. J. Strathy, Brandreth Symonds, H. Cabell Tabb, Harry Toulmin, G. H. Van Wagenen, Frank Wells, Granville M. White, George Wilkins, Thomas H. Willard and Algernon Woolverton. Total, 41.

The following candidates were unanimously elected to membership:

Dr. John B. Lewis, Travelers.

Dr. Henry Colt, Berkshire Life.

Dr. W. L. Paddock, Berkshire Life.

Dr. Elmer A. Scott, Provident Savings.

Dr. Thomas C. Craig, Manhattan Life.

Dr. A. H. Whitridge, Maryland Life.

Dr. James B. Steedman, Mutual Life of Kentucky.

Dr. William S. Manners, Metropolitan Life.

Dr. Eugene M. Holden, Metropolitan Life.

The minutes of the last annual meeting and those of the intervening meetings of the Executive Committee were read, and adopted as read.

The President then delivered his annual address. Unfortunately, part of the statistical material had been lost in moving from one room to another, so he was obliged to express his regrets at not being able to give a fuller address.

The following obituary on Dr. John Homans, 2nd, was then read by Dr. Frank Wells:

"Dr. John Homans, 2nd, was born in Boston on March 15th, 1857, and died in that city on May 4th, 1902.

"Dr. Homans received his preliminary education at the Boston Public Latin School and entered Harvard College, from which he graduated in the class of 1878.

"With inherited traits and a natural aptitude for the profession of medicine, he commenced the study of it at the Harvard Medical School, and graduated with the degree of M.D. in 1882, having served a year as house-officer at the Massachusetts General Hospital.

"After receiving his degree he spent two years in travel and study in Vienna and elsewhere, then returned to Boston and began a practice which became extensive among the best class of people.

"The underlying principle of Dr. Homans's life, that it is a man's duty to do all that he can for others and for the benefit of humanity, is better exemplified than by mere words in the recital of the many institutions and societies to which he belonged and among which he was well known. He was President of the Massachusetts Charitable Eye and Ear Infirmary, physician and director of the Home for Aged Men and of the Boston Asylum and Farm School for Indigent Boys, director and member of the executive com-

mittee of the Medical Library Association, a former President of the Massachusetts Hygiene Association, and a member of the Society for Medical Research. He was also Secretary of the Massachusetts Cremation Society, Assistant Secretary of the Massachusetts Society of the Cincinnati, trustee of the Massachusetts Humane Society, a member of the Loyal Legion, the Unitarian Club, the Military Historical Society, the New England Historic and Genealogical Society, and the Bostonian Society.

"The social side of his late life is represented by membership in the Union Club of Boston, of which club he was one of the governing board, the University and the Reform Clubs, of New York.

"As Assistant Medical Director of the New England Mutual Life Insurance Company, at many times called upon to assume the place of his uncle, Dr. John Homans, the Chief Medical Director, he brought to the position a ripe medical and surgical skill. His decisions were carefully and accurately made, and withal with a firmness and determination tempered by a breadth of liberality so needful in a medical adviser to a life insurance company. He rendered skilled protection to the company he represented, but in so doing never forgot justice to the applicant nor to the agent.

"By Dr. Homans's death the community in which he lived has lost a prominent citizen, the medical profession a valued member, his friends one who was always true and loyal to them, and this organization a beloved associate."

The following obituary on Dr. George W. Wells was then read by Dr. Emery:

"Dr. George William Wells, Resident Physician of the Manhattan Life Insurance Company, died at his home at Richmond Hill, Long Island, on September 2d, 1901, after a confining illness of four months.

"Dr. Wells was born June 5th, 1841, at Tyrone, New York. His preliminary education was obtained at Farmers Hall Academy, Goshen, N. Y., and under the tutelage of the Rev. Daniel Wells, of Goshen, N. Y., who fitted him for

college. He graduated at Princeton College in 1865, and immediately commenced the study of medicine under Dr. John Hudson Thompson, of Goshen, N. Y., and Professor L. A. Sayre, who was his kinsman.

"He attended a regular full course of medical lectures at the Bellevue Hospital Medical College, from which he graduated in 1868, and took the post-graduate course at the Long Island College Hospital, being assistant to Dr. French, Chair of the Diseases of the Throat and Nose, Assistant Physician to the Outdoor Poor Department of the Bellevue Hospital Medical College and Department of Diseases of the Chest, Assistant Physician to the Old Seamen's Retreat Hospital at Staten Island, New York. He practised medicine in New York for ten years and in Brooklyn for three years. He had been a member of the American Medical Association, Secretary of the Yonkers Medical Society, member of the New York County Medical Association, Kings County Medical Society, was for ten years Secretary to the Medico-Legal Society of New York, Secretary of the Society of Medical Jurisprudence and State Medicine of New York City. From 1870 to 1892 he was connected with the Mutual Life Insurance Company of New York in varying capacities from private secretary to Mr. McCurdy to that of Chief Medical Examiner.

"From 1892 until the time of his death he was Resident Physician to the Manhattan Life Insurance Company.

"It is within the writer's knowledge that Dr. Wells had for some time been gathering material with a view to publishing a work for the especial guidance of examiners in life insurance, but his death came before its completion. He was the founder and editor-in-chief of the *Medical Examiner and Practitioner*, and was the author of a long series of articles entitled 'The Medical Examiner: What He Does and Why He Does It,' 'Alcohol, Narcotics, and Tobacco as a Financial Issue in Life Insurance,' and many others of equal value. It may indeed be said with truth that he was an easy and prolific writer, with clear and forceful style.

"Dr. Wells traced his ancestry back to the Honorable

William Wells of Norwich, England, who emigrated to America in the ship *True Love*, five years after the Pilgrim Fathers landed at Plymouth Rock. William Wells was a lawyer and settled in Southold, Long Island. Several of his descendants made their way up to the middle and northern part of New York.

"From these pioneers was descended Alfred Wells, the father of George W. Wells. His mother was Lydia Westbrook Nice, daughter of John Nice of Pennsylvania, whose ancestors came from Germany.

"On June 29, 1865, Dr. Wells married Miss Emma Grant Hamilton, daughter of John Randolph Hamilton and Virginia Grant Hamilton, who, together with three married daughters, survives him.

"The foregoing is the simple record of his life, ancestry, work, and associates, but much more would be needed to present to you a complete picture of what Dr. Wells was to those whose privilege it was to know and associate with him.

"Dr. Wells had a bright and cheerful nature, a warm love for his family, and an unflinching devotion to those who had in any way befriended him. He was a ready writer, systematic and orderly in the arrangement of his material, exact in his presentation of facts, clear in his reasoning, and logical in his conclusions. He was industrious in his work, and indefatigable in the pursuit of any matter which interested him in his special line. In his examinations he was exceedingly careful, and his integrity at all times was undoubted.

"It will be of interest to many in this Association to learn that for more than ten years, at intervals, Dr. Wells, fought against the disease which finally caused his death, namely, chronic interstitial nephritis and, later, fatty degeneration of the heart, but his retiring nature in regard to his personal affairs was so marked that to those who daily associated with him no complaint was uttered by him, no sign was given intentionally of his deadly malady. Those whose privilege it was to be associated with him in daily work bear testimony to his unvarying excellent qualities as a gentleman and a scholar, a citizen and a friend.

"Dr. Wells's love for his profession was deep, and his respect for the same profound, and in the highest sense he honored it in his person and felt honored by it."

The following obituary on Dr. Frank K. Paddock was then read by Dr. Fred. S. Chapin:

"Mr. President and Gentlemen:

"On the 26th of July, 1901, shortly after our last meeting, in Hartford, Dr. Franklin Kittredge Paddock, Medical Director of the Berkshire Life Insurance Company, died at his home in Pittsfield, Massachusetts. Dr. Paddock was born in Hamilton, New York, December 19, 1841, and had therefore nearly completed his sixtieth year at the time of his death. Thirty-six of these years were spent in the active practice of his profession in Pittsfield, and his success was so marked that it may justly be claimed for him that for the twenty years prior to his death he was the most eminent physician and surgeon of western Massachusetts.

"Dr. Paddock was graduated from the Berkshire Medical College in 1864, and at once took a post-graduate course in New York under the special instruction of Dr. Austin Flint. Returning to Pittsfield, he was soon appointed to a professorship in the Berkshire Medical College, a position which he held until the institution was closed in 1867. He was Medical Director of the Berkshire Life Insurance Company from 1886, and Medical Examiner for the Central Berkshire district (under the law which superseded the old coroner system) from 1881 to the time of his death. He was one of the surgeons of the Pittsfield House of Mercy from its foundation in 1874 until his death, and during those years he performed a large majority of the operations. Dr. Paddock was at one time President of the Berkshire Loan and Trust Company. In 1873 Williams College conferred upon him the degree of Master of Arts, and during the years 1894 and 1895 he was President of the Massachusetts Medical Society.

"Dr. Paddock was a rare man, one of those men who inspire confidence and affection. Possessed of that founda-

tion of all intellectual excellences, a retentive memory, he was remarkable for quickness and accuracy of perception. He was a self-reliant man, and his courage was born not of vanity, for his modesty was proverbial, but of a correct interpretation of his own powers. Perhaps his most marked characteristics were unflagging industry and mental and physical endurance. He did the work of two men from early morning until late into the night, day after day, and year after year, and this was the more remarkable when we consider that he suffered all his life, from the age of sixteen years, with serious valvular disease of the heart, a condition which finally brought about his death.

"His relations with the institutions and societies with which he was connected were marked by a lively interest, on his part, in their welfare, and by the faithful and able discharge of the duties thereby assumed. He was much interested in the Association of Life Insurance Medical Directors, and seldom failed to attend its meetings and to add something of value to its work or discussion.

"Outside of medicine he was devoted to music and to farming, and his vacations were given to hunting and fishing. He was especially familiar with the habits of birds, and he knew much of the trees and the flowers. Simple and sincere in manner, of great kindness and cheeriness of heart, Dr. Paddock possessed the love as well as the confidence of his patients.

"In his death this Association has lost a valued member and the profession of medicine an example of the highest type of the general practitioner."

The Committee on College Instruction in Making Life Insurance Examinations, Dr. Frank Wells, chairman, reported no progress could be noted in Boston. In New York a course was delivered by Dr. Symonds at the University and Bellevue Hospital Medical College. Dr. Albright delivered a course at the Rush Medical College of Chicago and

also at the College of Physicians and Surgeons of Milwaukee. Dr. Toulmin reported that at Philadelphia the University of Pennsylvania and Medico-Chirurgical College were considering the matter favorably. Dr. Tabb stated that he expected to deliver a course of lectures at the Medical College of Virginia during the next session. Dr. Toulmin stated that, in view of Dr. Rex's restoration to health, he wished to offer his resignation as member of the committee. His resignation was accepted, and Dr. Rex was reappointed to fill the vacancy.

Dr. John L. Davis read a paper entitled:

THE SELECTION, SUPERVISION, AND COMPENSATION OF MEDICAL EXAMINERS.

By no means the lightest function of the medical director's office is that pertaining to the practical field work of examinations.

How to select examiners, how to supervise their work, and the proper method of their compensation has always been a perplexing problem for the home office.

In order to get the experience of other companies, I recently wrote to about twenty medical directors as to their methods. Their replies were prompt, full, and courteous, but only one or two are willing to acknowledge their methods are thoroughly satisfactory.

We are agreed as to the qualifications of desirable examiners—professional ability, good character, and accessibility.

The examiner's professional attainments are not necessarily those which would make him eminent as a teacher or a specialist. As a rule, specialists are not ideal examiners. He should have a quick eye and a well-trained ear; he should be keenly observant and alert to notice accurately an applicant's personal appearance, his manner, and his surroundings; he should be able to grasp the essential features of the

personal and family histories. Then he should be able to report these concisely and accurately on the medical blank.

He should be a man of character, as, happily, most doctors are. The physician's study, his training, his association, his whole life, tend to develop the best there is in him; so as a class no profession is more conspicuous for high character. Besides this, the examiner should be accessible and approachable; he should be busy, but not so busy as to be indifferent to life insurance calls.

It would be well if all examiners could understand something of the stress and competition which prevails in a well-organized insurance field, so they might understand fully and appreciate an agent's anxiety for prompt action. While I believe the doctor's first duty is to his patients, I know a medical call can sometimes be delayed with less loss than can an insurance examination; and all medical men of wide experience in practice and insurance work will readily understand this. When an examiner realizes how hard it is to write insurance, and under what difficulty and discouragements the agent constantly struggles, he will surely make every effort to promote and facilitate the work by prompt and careful attention to the medical features, and will not hesitate to speak a good word for insurance in general and for his company in particular. It is by no means beneath the dignity of the best medical men to indorse by word, manner, and example the noble work of life insurance.

There is no difficulty in getting splendid examiners in all large cities, where we naturally have our leading general agencies. Doubtless we are all personally acquainted with some examiners in most of the large cities.

So I should start with these centres. A company needs two or three examiners in every city where business is done. In my experience, the smaller the number the better, provided the work is done properly. When divided among a large number of examiners, there is no great honor in representing a company, and the fees are proportionately reduced.

I believe thoroughly in having a chief examiner, with one or two alternates; not in several examiners of co-equal

authority to be employed indifferently by the agent. Every case possible should be examined by the chief examiner. When it is impossible for him to attend to the call the medical report should be O. K.'d by him, with satisfactory reason for his non-employment. The several companies which follow this plan appear to me to have more satisfactory work submitted than we who leave to the agent a choice among several appointees.

The system of having a chief who personally examines or O. K.'s all cases effectually limits the agent to his employment, and in a great measure relieves the home office of those familiar, untenable, and far-fetched excuses for the employment of a second-rate examiner in a locality where the company has a more desirable one.

As the general agent's work extends to other cities, it will be necessary to get examiners for these places. This selection in the larger places can probably be best done through a travelling medical supervisor, who can consult with neighboring examiners already appointed, and gradually select men for the new places as business spreads. For every reason it is desirable that the most harmonious relations exist between the chief and his alternates, though I do not think the selection of an alternate should be left altogether with the chief examiner. The selection should rest finally with the supervisor. Whenever in a district or county an examiner shows himself to be pre-eminent, as they so often do, he can be trusted to recommend and select examiners for neighboring towns, and thus render valued services to the supervisor. My office has had a number of instances of this kind.

By pursuing this plan and gradually extending appointees, the field can be covered satisfactorily. At the same time the supervisor can keep an eye on the work of old appointees or look up some of the border-line cases that cause so much trouble. Where this is impossible personally to do, the supervisor is in position to call upon good examiners all over the country to act as his deputies in special cases. I believe one travelling supervisor on the road most of the time can very effectually cover the country in the way

I suggest. In remote sections, as the Rocky Mountain and Pacific Coast regions, where business justifies, doubtless a deputy supervisor would be needed.

While I believe one medical supervisor could attend efficiently to the work indicated, two might be needed to attend properly to the work where agencies are widely diffused. But if even more were required the advantages would far overbalance the expense.

If, however, it is thought necessary to keep down expenses, I know of no valid objection to several companies co-operating in supervisors, and examiners, too, in remote localities. The medical interests of insurance companies are identical, and are in no sense subject to the business competition of the agency department; hence for a long time I have felt that several companies could unite upon medical supervisors and inspectors, through whom joint examiners could be selected and their work supervised more thoroughly and with less cost than is now done by the companies individually.

My experience is that most of our best examiners work for several companies without apparent conflict of interest. My suggestion is to enlarge the field for such men, and let other companies have the advantage of such examiners' good work; and to have all examiners under the joint medical supervisors spoken of.

The great advantage of co-operation would, of course, be in remote and outlying territories. In the large centres, where agencies have long been established, doubtless individual supervision by the companies would be more feasible and satisfactory.

Personally, I find it of great advantage for the medical director, and it should be for the supervisor, to attend national, State, and district medical societies. You can always meet some examiners at these meetings and can become acquainted with medical men whom it will be to the company's advantage to know for future use.

The supervisor should arrange his trips with the view of constantly keeping in touch with his old examiners as well as

meeting new men whom he may need as business spreads. For him medical society meetings are not valuable so much for the professional papers read and discussed as that they afford a chance of meeting medical men in a business and social way.

Then I have always advocated a close relationship between the home office and the examiners. In the vast amount of necessary correspondence which falls to our lot, we are sometimes prone to forget to answer an examiner's letter or to notice some suggestion he makes. The point may be worthless, or his letter perfectly inane from our point of view; but to one who does not know, it is surprising how much a letter is valued by a great many of our medical examiners, especially if it is signed by the medical director himself. In fact, we are often very much bigger men to our examiners than we feel ourselves to be in the home office.

I think the medical director should even go out of his way to recognize conspicuous service or unusual care or thoroughness or especial hardships under which a local examiner has made his report. I assure you the courteous recognition of these things is valued by our examiners often far beyond its deserts.

When we consider the thousands of examiners in our employ, and how few relatively there are who go astray or try to impose upon the home office, we should be justly proud of our profession. The few who do need watching and weeding out are a comparatively insignificant number.

We ourselves have all served long apprenticeships as medical examiners, and among the thousands of examinations made can recall many trying cases that worried and bothered us. We can even now remember how grateful was a word of congratulation or encouragement from the home office.

As long as such memories dwell with us, I think we can keep in pretty close sympathy with our medical representatives in the field.

As to compensation, I believe in good pay for good services. There may be some difficulty in agreeing exactly as to what fee is considered good pay; but we all know no man

will render his best service if he feels constantly that his work is not fully recognized and is poorly paid for.

In some sections of the country, local societies have adopted fee bills, to be rigorously lived up to—that is, more or less rigorously—by the faithful. A very wide experience with these miniature trusts has convinced me that they are very good for the prosperous old doctors who get big fees in spite of the scale, but are disastrous to the hopeful young doctors who are thereby eliminated from the problem.

Some of these societies at times make fierce protests against examination fees of less than \$5, and often threaten to boycott really good insurance companies. They are indigenous usually to sections of the country where low medical fees are charged, and in places where the quality of the profession is of such a grade as to limit its prominence to the nearest county lines. As a rule, however, no trouble is experienced in getting equally good examiners not connected with these societies.

I think a fair basis for valuing the examiner's service may be found in the average physician's fee in his daily practice. An insurance examination should not demand any greater medical skill nor require any more time than the thorough and careful examination of a patient in your office or at the bedside.

What is the average physician's charge for a consultation or for a visit? Possibly no general figure can be named. It varies with localities; the highest figures, of course, rule in the cities; in the towns, fees are moderate; and the country doctor, who as a matter of fact is the most prosperous relatively of all medical men, often does not see the color of gold, but largely trades out his services in goods and chattels.

An interesting paper was read last year by a Chicago physician, showing the income of the great mass of doctors of that city. Excluding the specialists and a score or more of very eminent men, the essayist stated that the income of the average physician of Chicago is between \$1500 and \$3000 per year. I am inclined to believe his figures very fair.

If these figures are correct for a large city, we know the

average income of other places is less. So we may fairly conclude that the year round the ordinary physician in the best places does not collect over \$10 per day.

My experience is that for a medical visit the fee in cities is from \$1 to \$3; for an office consultation, not over \$1 or \$2. Of course, in every community there may be one or more very popular men who command higher fees; but our ordinary examiners are not usually specialists, nor perhaps the busiest men in their towns.

With this understanding, I feel that \$3 is a fair fee for the usual examination, and graded scale of fees such as several companies have is liberal; that is, \$3 or \$5 for an examination, with \$3 to \$5 extra when microscopical examination is made. The scale is graded not because it is easier to make the \$3 report than the \$5, but simply because in smaller policies \$5 is too large a percentage of the premium to charge as an expense. And, in my opinion, really \$3 is a liberal compensation for the ordinary examination, when compared with the amount of other medical work a physician will do for \$3.

I will go a step further, and suggest that when a physician does a large amount of examining he becomes so quick and expert at the work that he can afford to accept even a less fee; and it is a fact that some of the best companies pay some of the very best examiners an average of less than \$3. I am not now speaking of certain examiners who receive a fixed salary.

An honest examiner will do just as good work for \$1 as for \$5, if the company requires the same work for both cases. His medical report will be just as reliable in one case as in the other. If, however, he feels he is giving too much work for his fee he resigns.

But my experience is that few resign and few are dissatisfied; the protests against reduction of rates come from men who do not examine; the really busy examiners have no time to meet together in pusillanimous conspiracies looking to the regulation of the company's financial matters.

Upon the whole, I think the average examiner is rela-

tively as well paid for his time as is the average agent—and usually is better paid. In the aggregate, insurance work means two to three millions of dollars annually to the medical profession of this country; no other single source brings physicians so much; no other client pays so gladly and so promptly and without discounting a single dollar.

It is the hope of every medical director that for many years to come this vast sum will continue to enrich examiners' coffers, and we hope the day is far distant when managerial economy may suggest the abolition of medical examiners altogether, as has sometimes been tried.

Doubtless that ill-starred day is remote; yet at times I seem to see some shadowy signs portending a coming storm.

The paper was discussed by Drs. Rogers, Marsh, Hamill and Wells. The discussion was closed by Dr. Grant.

Dr. Robert L. Burrage then read a paper on

PRESENT STANDARDS IN MEDICAL SELECTION.

This paper should perhaps be prefaced with an apology for presenting to this Association anything but a medical subject, and you are assured that such a departure from the ordinary is not taken with any degree of confidence; but as a reason for doing so I desire to say that many times during the eight years it has been my privilege to be on the roll of membership it has occurred to me that we were not getting all the value possible out of this organization. Not that I deprecate for a moment any portion of our past history, for I can testify, and I believe every member will agree, that the papers, discussions, and change of views incident to our meetings have been of great practical benefit; but these meetings, as most of them have appeared to me, have been of a rather desultory character—held without any particular object in view, and therefore not fraught with the same value that one can readily imagine would result were they convened with the distinct purpose of discussing and establishing

the very best line of practice to follow upon matters of vital importance to the interests of which we are the custodians.

The duties of life insurance medical officers are manifold, expanding yearly with the marvellous growth of the institution, and are not, as the title given to our positions, altogether of a professional character, but as a matter of fact are made up very largely of managing details that are purely businesslike in their nature among which may be mentioned the arrangement of our department, the organization of and distribution of work among a clerical force, the directions of methods by which our companies' business is handled in transit, the management of correspondence, the keeping and utilizing of records, the exchange of information with other companies, the providing of inspection or detective service, and the appointment and organization of a corps of medical examiners along such lines as will harmonize the various interests of the business.

Our strictly professional duties are confined to selecting from the mass of proposals *all* such lives as may be safely insured on some form of contract issued by our company—not an easy task when it is considered that this selection must be made with such judgment as will guarantee, at the worst, a liberal percentage within a normal mortality record.

For all of this business detail it would appear that there must be approximately correct methods under which some of us may be operating, but of which many of us may have very little conception, and so far as the selection of risks is concerned it is a self-evident proposition that there must be some standard which, if attained, would operate with justice to every applicant and safety to every company. It is, therefore, my belief that the work of this Association should be directed toward the development of such ideas as will point out the best plans of procedure, and satisfy us that our own department is being conducted, not better, but as well as that of any other company, and to establish such standards for selecting risks as will at all times be not only consistent, but as nearly correct as human forethought and intelligence can make it; and I submit to you, gentlemen, that whatever

can be accomplished in these directions will be in fulfilment of the only objects that give the organization any excuse for existence.

As it would hardly be practicable for any one essayist to take enough of the time of this meeting to review with any advantage all of the business features of our work, it is proposed to pass by those of lesser importance—such as the arrangement of a department, the organization of a clerical force, the handling of correspondence, the keeping of records, and the direction of business in transit; because we all recognize that our management of these details must depend on the facilities at our command, which facilities depend entirely upon the accommodations given us by our respective companies, and the ideas of our executive officers as to the quantity and quality of help necessary to accomplish the best medical work.

There are three branches of our service, however, which are of paramount importance, and concerning which it appears that every company should wish to meet on a common footing with a desire to aim for the most perfect results, and upon these three points it is proposed to speak freely and at length. They are:

1. The appointment and organization of medical examiners, and the regulation of their service.
2. The provision for inspection or detective service.
3. The mutual exchange of information concerning applicants and examiners.

Medical examiners.—It is reasonable to believe that if there is one thing more than any other upon which the ultimate standing of any medical department depends it is the calibre of its examining corps, and it follows that the selection and organization of medical examiners is one of the most important, as it is probably one of the most difficult, tasks ever present with the medical director.

For these important positions we are being called upon daily to provide men who will be creditable to our organization, both professionally and socially, capable to protect our companies' interests, and of such integrity as will guarantee

that they will under any and all circumstances live up to their capability—and withal of sufficient tact to maintain the harmony necessary between medical and agency work.

This task in the agency of a large city, where the applicants are numerous and the emoluments considerable of an object, is a comparatively easy one, but in small rural agencies where the demand for individual service is limited, although from which in the aggregate the amount of business is large, of a desirable quality, and of great importance, there are many difficulties to surmount, and it is safe to say that we all experience how troublesome it is at times to find the thoroughly qualified man whom we can mould into an enthusiastic attaché of our company, and who is willing, when occasion demands, to meet the emergencies of the business by sacrificing an hour of professional work, in all probability of more financial worth to him than the fee for any insurance examination.

We are all equipped with a staff of examiners selected, as we believe, with care and with which we feel pretty well satisfied; and yet I imagine it is not an infrequent experience for any of us to face a situation where we are simply unable to obtain good business service from men concerning whose professional qualifications there can be no doubt, and to discover others who are giving incompetent or worse reports.

The question arises as to whether these difficulties come from our initial selection and primary instruction of the men to whom we must intrust our local interests. Many of them undoubtedly do, and I often wonder whether any two offices follow the same plan in this important matter, and more often feel that I would like to know which method is the best.

Some companies appear to depend largely upon their agents to nominate examiners, supplementing the nomination by correspondence with references named by the applicant for appointment, all of whom are, of course, his personal friends, and naturally never give any but a favorable answer to the inquiry. The plan may be good, but appeals to one who has tried it to a very limited extent as of doubtful value.

Selections made directly from the home office by aid of

commercial agencies, local business men of prominence, officers of local medical societies or neighboring physicians of repute all would appear to promise better results than the plan just mentioned, and better still should be the selection by local referees, and yet we think in our office that even this plan has not given results at all commensurate with the expense it involves. We feel in our department that we have been very fortunate in having a considerable number of our examiners originally selected, and a still larger number given some instructions, right on the ground by one of our office staff, and are prepared to testify that in every agency where it has been possible to so select and instruct examiners, the quality of service has been very satisfactory indeed. Without referring to other methods, we may say that every medical director follows one or several lines of procedure in selecting examiners which gives him satisfaction, but among so many methods there must be some one certain to yield the best results, and a portion of one of our sessions devoted to demonstrating which plan is the best might mean material benefit to not a few.

The number of examiners in an agency and their standing is a question of importance upon which there is anything but uniform practice. In years gone by it was almost the universal custom for a company to have in each city one chief examiner and an alternate, and to have a stringent regulation requiring every applicant to be referred to the chief, refusing to accept an alternate's report without permission from the home office, or the showing of good and sufficient reason for his use. While I am not sure that this plan is not the safest one, it remains a fact that the delays often incident to it are very liable in this day of active competition to, at times, result in the loss of what would be a desirable policy-holder. This question is one that we have been troubled with considerably during the past year, and we have found by means of some quite recent correspondence that many of the offices are getting away from this old idea and are appointing in all communities two or more men of equal rank from whom reports are received without question; and this is probably the

better plan if the danger of carrying it too far be avoided and the number of examiners kept within the bounds of absolute necessity for local needs.

In the city of Chicago, the Prudential has in operation a plan combining medical and inspection service that has proven eminently satisfactory, the details of which may be of interest to some of you. In that city there are fourteen offices writing ordinary business, with nine examining physicians—one of them being our referee, to whom every application must be given. He gives his personal attention to as many as he can look after promptly, and immediately distributes the balance among his assistants. At a regular hour each day his messenger calls at every office for the applications and the distributing is done by special delivery postage, after a record is made of each application. The examiners are required, as soon as their work is completed, to forward papers directly to the home office and report their rating of risk, with any special comment, to the referee, who alone knows the company's inspectors and at once orders such inspections as in his judgment are necessary. These inspection reports often reach the office the same day and rarely more than twenty-four or forty-eight hours later than the application, thereby enabling us to dispose of business very promptly. The plan involves a little extra expense—a clerk for the referee, who is paid a small salary by the company—and the cost of postage and messenger service. Each week a report is made by the referee to the home office, showing the agency writing every application, name and address of applicants, the examiner to whom they are referred, and when, the date on which examination is made and papers forwarded to home office, and the reasons for any apparent delay. Three years' experience with this service have made us feel that it cannot be surpassed. The average time consumed in starting applications to the home office is about two and one-half days, and we have had as many as 250 applications during a single week examined in an average of 2.01 days, an average that would be very largely reduced could we exclude the few cases always in evidence requiring half a dozen or more calls.

Inspection of risks.—Fraudulent transactions in this business are perhaps more frequent than any of us suspect, and the value of commercial, or, more plainly, purely detective service, is universally recognized as an adjunct to good medical advice in the selection of risks. The arrangement, therefore, of an efficient inspection service is a detail of no small importance. Whatever may be the source from which information purely along the line of moral hazard is sought, we all seek it more or less. Some of the companies maintain an independent inspection bureau—inspecting every risk at an enormous expense. Others employ the various commercial agencies for this line of information, and some look to their agents to point out vital defects in risks that, from a physical standpoint, are evidently all right; and, no matter what may be the particular plan employed, I guess we all have good reason to know that the delay incident to securing a satisfactory line on the personal habits, financial standing, and environment of our applicants gives rise to no end of complaints, correspondence, and annoyance—to say nothing of the fact that the information is often faulty, causes good business to be turned away, and leads to the acceptance of some that is not desirable.

A number of years ago the theory was advanced in our office that when a medical examiner was personally acquainted with an applicant he, above all others, was the one best calculated to give reliable information on these special points, and in application of this theory we devised a special blank covering them, placed the blank in the hands of our examiners with instructions to use them in any case when, in their judgment, the information called for would be of value, and whenever used to charge an extra fee of one dollar. The results in the main were satisfactory. We know positively of one case where the use of this form saved the company a claim larger in amount than the entire expenses of these reports, and the plan would probably be in vogue to-day were it not that the examiners' itch for the extra fee became so contagious that they formed a habit of sending in these reports with nearly every application; in hundreds of which

it was a manifestly unnecessary expense, and it was discontinued. Since this time, until recently, we have been drifting along with our individual inspectors in some places, the commercial agencies in others, but never leaning on any one with an interest in the issue of the business.

For some months, now, we have been going back to our doctors, without, however, setting up the temptation of an extra fee. By correspondence and by personal interview whenever possible, we have pointed out to our examiners how valuable to the company these special items of information are, and appealed to them, whenever personal acquaintance made it possible for them to do so, to add a few lines to their reports bearing thereon. Our requests have met with a most generous response, and we are at this time receiving from a great many of our examiners a better line of moral-hazard information than could possibly be obtained from any commercial agency or private inspector, and all without cost, and intend, as rapidly as possible, to extend this plan throughout our entire service.

In one of these meetings, several years ago, Dr. Curtis remarked that information not explicitly asked of a medical examiner should not be expected, but that it was a simple matter to find out from a doctor anything that you wanted to know about an applicant. Our experience verifies this claim.

Medical reports.—Whether a company's interests are best conserved by the examiner delivering his reports directly to the home office, or by handing them to a general agent to review, criticise, and forward, is a question which it would appear can be answered only in one way; and yet it is a fact that very few companies require their examiners to treat medical reports as confidential documents and forward them directly to the medical department without exhibiting or allowing them to go through the hands of an agent or any third person. The advantages of this plan are so manifest that it is hard to fathom the reasons for tolerating any other. Surely it is the only way to keep medical information confidential, and to obtain on the report an unreserved ex-

pression of the examiner's opinion, besides being a guarantee that no attempt will be made by a general agent to persuade an examiner to shade points that might have an unfavorable bearing. In my personal experience as an examiner, I have more than once been asked by an agent to take off a few pounds of weight, to modify a statement with reference to habits, to qualify a remark about occupation, to examine a second specimen of urine, and if found all right to conveniently forget to mention that a specimen examined the day before was a trifle "off," and in many instances to entirely suppress an examination, accepting therefor my fee from the agent, and give him an opportunity to try and slip his man in another company.

There is not an argument in favor of the other plan with which I am not familiar, and there is not a year since I have done office work that all kinds of pressure have not been brought to bear to induce our company to alter its practice. There is hardly a week that we do not see copies of reports made to other companies being made public property—hacked into our office, and we presume others, for a review. We know of an office building in one of our large cities in which are located half a dozen or more offices. The general agents are all good fellows and good personal friends, and make no secret of their plan never to drop a case until it has gone through every company represented in the building. This is made possible by a plan which enables the general agent to have a copy of every medical report, and entails as a lesser evil a waste of very valuable time to many of us, who can hardly find hours enough in a day to complete our allotted tasks, and in our office we hope that our own plan of making a medical report a matter solely between our local examiner and our own department will continue to receive, as it always has, the support of our executive.

Exchange of information.—The exchange of information concerning declined risks and unsatisfactory examiners is of sufficient importance to make every one desire to get everything possible out of it. This exchange may certainly mean a great deal or a very little, just in accordance with the way

in which it is conducted, and it is submitted that care should be given in the answer of every inquiry to give fully any information of interest that may appear upon our records. The Lord knows that we are all burdened with an amount of correspondence which makes it desirable to do away with everything possible in this line, but in our experience very many unnecessary and unsatisfactory letters have to be written because companies use no care in the answer of an initial inquiry.

It is not at all uncommon in our department to receive information that an applicant who, according to our papers, inspection report, etc., appears to be a desirable risk has been refused insurance elsewhere because of "moral hazard," "personal condition," "not recommended by the examiner," or some other equally lucid reason. Such information means nothing and is absolutely without value; and what follows? A letter to the corresponding company asking for details. Sometimes you get them; often you don't; and often you receive a letter regretting that John Jones was declined upon information so confidential that it cannot be committed to paper, but that it will gladly be given to a trusty representative if you will send him to the office—a request easy to comply with in view of the number of trusty men we have lying around idle! We have actually had a request of this kind from a Philadelphia office, and that during the latter days of December. They have been countless from the various New York offices, and we are looking forward to a desire on the part of our friends in Hartford, Milwaukee, and San Francisco to see our ornamental trusty man who has nothing to do but run errands.

Seriously, however, we all appreciate that there is lots of information concerning applicants and physicians that it is perhaps not wise to commit to paper in a way that will afford any chance of its getting back at the company in the shape of a suit for damages; and with a desire to obviate all difficulties in corresponding about this kind of business, we have received competent legal advice that it would be perfectly safe for us to write full details concerning any case on a

blank sheet of paper, omitting names and all items establishing identity, and send this sheet to any company, attached to the return portion of the inquiry blank. We shall follow this plan in the future, and hope that you may see your way clear to do likewise.

This subject is spoken of with a full appreciation of the shortcomings of our own office, and we are anxious to make our information to you so comprehensive as to never make a second inquiry necessary, and perhaps more anxious to have you treat our inquiries more generously.

We believe that to a large majority of the producing population life insurance has at this time attained the position of a vital necessity; and assuming that all who apply for it do so in good faith, sight should never be lost of the fact that, while our first duty is always to conserve the best interests of our own company, every applicant has certain rights that it is unfair to disregard, and that not one should be refused the protection for which he asks thoughtlessly, or without good and valid reasons.

The selection of lives for insurance should come pretty near to being an exact science. As a matter of fact it is anything else, but is governed by a lot of individual opinions and impossible theories, which subject men engaged in the work to charges of inconsistency and empiricism,—very often more deserved than any of us care to admit. I venture to assert that any of us who will review our daily work at the desk will agree with this statement, for it is not at all an infrequent experience to see risks, in which we can see no earthly good, accepted with open arms by another company, and, on the other hand, for us to advise our company to issue insurance on people whom we fail to fathom why others should refuse, and once in a while to see from them an early and, of course, totally unexpected death claim. Further than this, a guess is hazarded that men engaged in the same office, whose daily association one would think likely to develop similar trains of thought, not infrequently disagree as to the desirability of a certain proposal. Such conditions should not exist, but they do, and most certainly warrant a strong plea that we

should arrive at some standard upon which our risks can be selected.

Laws are formulated to meet necessities, and the opportunities of this Association to establish laws upon which may be founded a standard of selection are almost without limit; for in the various offices here represented there are masses of records of actual practical experience which, if properly collated and analyzed, would result in deductions that would enable us all to meet with intelligence every possible insurance proposition.

Doubtless the expense of getting out all of this data would be great, and the work enormous, but in the course of a few years it would surely prove to be a paying investment, as it could not fail to result in the attainment of what, after all, is the great ultimate object of our labors—the acceptance by our company of every worthy risk proposed and refusal of every one not promising to yield a legitimate profit—the two objects which, if correctly accomplished, mean always benefit to our company and its policy-holders, and justice to every applicant.

There are certain factors which have a distinct impression on the monetary value of a human life, and it should be for this Association to determine just what these factors are, and to place a correct estimate upon every one of them. When it does so, and when its members in the performance of their daily duties apply these estimates correctly and with uniformity, it can be claimed that risks are assumed on a nearly correct scientific basis; but until such a time arrives we shall continue as at present to drift along, every man acting on his own ideas, which, in the majority of instances, are doubtless correct, but which at times are so much at variance with those of others who have given the subject at issue the same painstaking thought that certainly one or the other must be wrong—to the very serious detriment of both interested parties, the company and applicant.

It is not necessary to take the time, and further it would be a presumption on the part of the writer, to enter into the details of whatever his personal views may be concerning all

of these factors and how they should be dealt with, for presumably we all hold similar views as to what they are, and on many of them we surely must be a unit in action.

No company whose practice is confined to the insurance of so-called standard lives will accept any person presenting the appearance or indications of impaired *personal health*, who is addicted to intemperate or vicious *habits* of any kind, in the insurance of whom there is a distinct element of *speculation* or *moral hazard*, with a distinctly bad *environment*, or belonging to the vicious or indolent classes; but on the other hand all companies claim to seek as their policyholders healthy people, in at least fairly comfortable circumstances, who are temperate, industrious, thrifty, and justly considered to be good citizens.

There are, however, several factors of importance, and so recognized by all, but which are looked upon so differently by different medical directors that what is left of my time will be taken in commenting upon them.

There is, I believe, no one in this Association ready to claim that *family history* is not an important factor in an insurance risk, but who has failed to notice and marvel at the varying success with which people with an impaired family record apply to different companies for insurance? If you can call to mind the details of a report made by a committee several years ago showing the opinion of all the companies in connection with consumptive family histories, you will appreciate how far apart the views of many of us are upon this more or less important factor. The term "more or less" is used in this connection intentionally, because family record, as we receive it, is so notoriously unreliable that the possibility of eliminating it altogether from our investigation of an applicant is well worth considering, which would mean, of course, the determination of some plan that would enable us to accept or refuse an applicant on his present physical condition and other factors which we may be sure are correctly before us. But as family history is not likely to be eliminated from our considerations for a long time to come, would we not, so far as consumption is concerned, in view of the marked

advance in professional knowledge of the etiology of this disease, be justified in giving great weight to such elements as physique and freedom from contagion, that appear in many cases to contra-indicate any individual liability to the disease?

More emphatically than with consumption do I believe that this consideration of individual liability should weigh in supposed tendencies to other maladies.

Personally, it would be very satisfactory to me to know just how we should estimate apparent family tendencies to degenerative disease. I have observed closely the views of some men in this Association for whose opinion I have the very highest regard, and on account of them have more than once hesitated in following my own best judgment but after looking back over my own experience in practice, and searching such published authorities as I could, cannot convince myself that it is necessary to refuse insurance to a man who gives even a pronounced family history of Bright's, apoplexy, rheumatism, heart disease, etc., unless, in addition, his personal health history, physique, the condition of his circulation, his occupation or environment or other conditions point toward a personal liability to whatever disease may be in question.

The diseases mentioned above are enough to serve as an illustration to a thought which applies to many others of greater importance than that already considered; that is the factor of *personal health history*, and here also we find anything but a uniform practice, and so markedly different do we find our views on many important points coming under this heading that without doubt we often find ourselves wondering how the other man can possibly think as he does. Without even mentioning the list of diseases concerning which we are accustomed to seek a full line of information, we will use as our illustration of this factor the histories of the various urinary diseases which we are called upon to consider every day and which is selected because it would be of undoubted and great value to correctly estimate.

It is certain that only a very few years has served to

develop a liberality in the treatment of this class of cases formerly unheard of. As recently as when the writer began work at the desk an albuminuric or glycosuric history almost invariably debarred from insurance—and always so when an applicant had passed middle life. Apparently some of the companies to-day adhere to this conservative practice, while others seem to disregard these histories at any age unless very recent, and as a rule a very few months' freedom from manifestations of what very often eventuates in chronic serious diseases, sure to materially shorten life, is all that is required to secure insurance. This liberality even appears to extend in many offices to the more pronounced evidences of lesion as manifested by casts, certain forms of which do not appear to be regarded as significantly by some authorities as by others. It is not for the writer to say which view is correct—frankly, he does not know, but has a pronounced leaning toward what he was taught years ago to the effect that it is not the function of the normal kidney to excrete abnormal urine. The thought, however, that it is intended to convey is that possibly the apparent tendency of to-day is in the direction of over-liberality, and, if so, the sooner we find it out the better it will be for our future mortality records.

It is not without interest to observe how differently the various companies regard the factor of occupation. Every medical man appreciates the fact that a man's daily task and environment has a distinct impression on his longevity, and that to say nothing of the occupations which involve a high accident hazard. There are large classes of artisans who age prematurely, and die young—the reverse, of course, obtaining in many others—and of great interest for insurance companies to remember is the fact that very often those engaged in the most unhealthful trades are grouped together in large communities.

In the face of this knowledge it is a fact, if the records of practice on this point as compiled by Mr. Standen several years ago are correct, that there is absolute lack of uniformity in the treatment of occupations, and, no matter what a man's calling may be, some company stands ready to insure him on

some plan from the highest to the lowest rate, and it follows that risks are being assumed which cannot but result in abnormally high mortality.

It is recalled that several years ago a committee appointed by this Association to consider this very topic made a partial, although very elaborate, report, upon which no official action was taken, and the matter then ended, and it is very apparent that on this important factor we are only drifting,—every man acting according to ideas which may or may not be correct; and it is suggested that a continuation of the work of this committee and a tabulation of the results of its work would be of practical value.

Men for whose opinion we must have equal respect have widely divergent views on the factor of physique—justly considered an important one. This fact is patent to all who remember the discussions of '99 and of last year, during which it was shown that the overweight and the underweight as well as the man of average build have their advocates in this body. We cannot but remember with pleasure the very masterly presentation of this subject by Dr. Rogers at the Hartford meeting, and I am sure that there is not a member but would like to have a copy of that paper for reference.

With a mention of one more factor—*insurance history*—I will close. Experience has given me a most wholesome respect for records, and I firmly believe that this history is worthy of the most careful consideration in connection with every application. It is a part of our daily duty to consider proposals that have been previously refused insurance. We cannot get away from it, and while I do not believe we should blindly refuse an application just because some one else has done so, and not give full weight to the results of our own investigation, I have a feeling that, taken as a class, these people are dangerous to deal with. Cull them out as carefully as you may, from such of them as you accept there is sure to be an excessive mortality. At least it is my impression (a crude one, I admit) that such has been the experience of the Prudential. For many years, in the distribution of our office work, the applications showing rejection

records from other companies have been disposed of at my desk. These records naturally prejudice one against a risk, and they have all been considered with the greatest care—no channel of investigation after everything unfavorable has been passed by—and in spite of everything year after year from 40 to 50 per cent. of these cases are accepted. Judging only from the proportionate number of claims paid, without any knowledge of amounts and exposures, I am convinced that no other class of business has resulted so unfortunately. It is realized that this statement is not based on facts accurate enough to make it the basis of an infallible opinion, but we believe that it indicates the necessity for a thorough analysis of this class of business (which we hope to have made from our records in the very near future) and the results of which we will very gladly lay before you at some future meeting, should you be interested enough to want them.

I appreciate the fact that the subject which I have endeavored to present has not been thoroughly covered, but it has been my desire to offer a few illustrations which might engender the thought that it is very desirable for our medical departments to reach some fixed standard upon which to do their business and select their risks.

It has been claimed that illustrations never illustrate, and if this is the case with mine I can only regret having taken your time, but be this as it may I have taken enough. Surely we all hope for the time when we can feel sure that we are doing our business in the very best possible manner, and when the refusal of insurance by a first-class institution will be a pretty good guarantee that a man is not a safe insurance risk. To say nothing of the expense saved our companies should this time ever arrive, think of the unnecessary labor and vexation that will be spared the medical officer.

None can claim anything above mediocrity at this time; else why the large number of rejected cases reconsidered and approved, showing that by some means we have been convinced that our original opinion was wrong? For this there can hardly be any excuse, for, lacking absolutely new evidence as a rule, one's first impression of a risk is liable to be the

correct one, and we should try to avoid any position making a change of it possible. There is a certain amount of humiliation in "eating crow," as well as liability to a grave error.

It has been claimed that on some occasions executive or other equally powerful influences cause us to waive our opinions. This has never been a personal experience, and I doubt very much, if we were prepared to say in connection with any doubtful problem that our solution of it is in accordance with the concerted opinion of the Association of Life Insurance Medical Directors, that any executive would go behind it or criticise any unfavorable result.

When we rid ourselves of such of our own weaknesses as others can see, our opinions will always have the weight to which they are entitled.

The Association then adjourned to Delmonico's for dinner, Dr. White being Chairman of the Dinner Committee. Those present were Drs. Woolverton, Scadding, Craig, Scott, Grant, Lounsberry, Northcott, Burrage, Tabb, Wells, Shepherd, Hamill, Fisher, Wilkins, Chapin, Davis, Rogers, Symonds, Porter, Morgan, White, Knight, A. S. Manners, and Willard.

It was a very enjoyable affair. Mr. Haley Fiske, Vice-President of the Metropolitan Life Insurance Company, made a very spirited address which was listened to with great interest by the members present.

SECOND DAY.

Dr. Frank S. Grant read a paper on

OVERWEIGHTS IN WHOM THE ABDOMINAL GIRTH
IS GREATER THAN THE CHEST AT FULL
INSPIRATION.

OVERWEIGHTS (MALE).

When Cæsar said: "Let me have men about me that are fat, sleek-headed men, and such as sleep o' nights: yon Cassius has a lean and hungry look," he probably had reference more to the proverbial good nature and even temperaments of fat men over lean than to any comparative longevity of the two types.

Now, gentlemen, I am not going to attempt to carry you back to the period of the Pyramids or Rameses, to Hippocrates the True, on the one hand, or Paracelsus the False, on the other, in collecting material for my subject.

We live in a very live and energetic century. All the intelligent world demands facts, not theories; and facts are what I shall try to place before you.

I entertain the highest respect and admiration for those men and women of letters who have the talent, the time, and the libraries at their command which enable them to write exhaustive treatises on subjects of special selection, going back to the earliest periods of available data, and bringing them down to the present time. But it seems to me, in an organization such as ours, that which we most want is *material* points, sure and certain, and which shall prove of practical usefulness and as rational guides to our actions and judgments.

It has been said that while figures never lie, those who make them sometimes do—unconsciously.

"On the use and misuse of statistics," out of a little pamphlet recently issued relative to that vexatious problem, the regulation or segregation of prostitution, the following very true statement was taken, viz.:

"Statistics, even *accurate* statistics, may be very useful

and instructive or very harmful and misleading, according as they are 'all around' in their character, and looked at in relation to all the facts of the case, or otherwise. Moral reformers, Christian workers, rescue workers, medical men dealing with special maladies, indeed, specialists of all kinds, are very apt to fall into a similar mistake, and judge the whole of society by the particular section of it with which they are so well acquainted."

For two reasons, I shall not weary you with historical data or with redundant quotations from this or that authority. First, because I hope to command your appreciative attention to the brief remarks I have the honor of presenting, based upon personal observation and experience, and, secondly, because in our special field of work, life insurance statistics are as yet rather meagre, or at least difficult to get at.

It is to be hoped that as time advances, and the valuable information accumulates in our companies' offices, the same will be made more generally public and available.

The chart which I now place before you is the record of 191 claims out of 1090, or 17½ per cent., covering a period of ten years—1883–1893—of overweights where the belly or girth measurements were in excess of the chest on inspiration, at the date of entry.

My main object in taking this selection is to endeavor to prove that overweights with preponderance of adipositas below the belt are an exceedingly extra-hazardous class, or even possibly not insurable at all on any plan without financial loss to the company.

The chart is so arranged as to exhibit the causes of death, number of cases from each cause, percentage of overweight each case, average age of policy, and average age at death. On the extreme right of the chart I have given you, for comparison only, the relative mortality between overweights and underweights, covering the same decennial period, and including the same causes of death.

The percentages of overweight are all estimated from Dr. Rogers's "Nylic" table of heights and weights. Striking,

then, a general average, you will observe that this list of 191 cases shows an overweight of 17 per cent. for each case, age of policy 4 years, and age at death 52 years.

As early as 1883, when I first became connected with life insurance work, I was impressed with the premature mortality following the insurance of heavy men, this impression being then formed, for the most part, by the reading of such statistics as I had at my command and from conversations with my confrères.

In January, 1885, I read the report of the late Dr. Thomas A. Foster, Medical Director of the Union Mutual Life Insurance Company of Portland, Maine, upon the death losses of that company for eight years, ending December 31, 1884, and again I was forcibly impressed with the importance and significance of overweights, so graphically and admirably set forth in Dr. Foster's tabulations.

Referring to Table No. III. on relations of height to weight, page 14 of his report, Dr. Foster remarked: "This table, it seems to me, is of very great interest and importance, as it brings so prominently before us a point of danger, so generally overlooked by medical examiners, viz., the increased risk of overweights. It will be seen here, that of the 155 who died of heart disease, 21 per cent. were overweights; of the 69 from apoplexy, 23 per cent., and of the 103 dying from kidney disease, 24 per cent. were overweights, while of the 208 dying from consumption there were but 3 overweights and 7 underweights."

Thus you will notice, gentlemen, that there is not so very wide a variance between Dr. Foster's collated cases and those of my own, though in the first instance the American Standard, and in the second Dr. Rogers's table, was used in the estimations.

As the result of personal investigation into the mortality experience of my own company during the first five years of my incumbency, this question of overweight grew more and more upon me.

Dr. Shepherd's paper on the "Relation of Build [*i.e.*, weight and height] to Longevity," which later was published in the

Medical Examiner, July, 1899, the discussion of that paper and Dr. Rogers's presentation of his graphic standard table of heights and weights, Dr. Hamill's "Observations Regarding Risks Declined by the Prudential Insurance Company of America, from March 5, 1888, to January 1, 1893," and, finally, Dr. Rogers's most excellent and comprehensive paper on the subject, read before this association at its last annual meeting, have all contributed to the giving of my own limited experience along similar lines.

My record covers but one decennial period. It would be both interesting and instructive, I am sure, to follow this study up and to present the experience of the company in the next ten years; of one thing I am certain, viz., it would show a marked improvement over the first decennial mortality of this special class of overweights, and I trust, at some future date, the comparison may be laid before you.

Now, gentlemen, what are the conclusions to be drawn from the exhibition of this chart?

Without going into the etiology and pathology of the subject, it is quite evident we must regard overweights, certainly of this particular class under consideration, as very wide departures from the normal man. We must recognize extreme corpulency, if not direct evidence of disease, at least greatly conducive to disease, carrying men off short of their natural expectancy. They belong to a class so largely disposed to gout and its congeners, lithæmia, alloxuria, auto-infections, fatty degenerations, and arterio-sclerosis.

It has seemed to me that with the growth and prosperity of our country, the ease, good living, indolence and lack of regular exercise of its financially successful men (and these are the ones who apply for large amounts) our national type may be changing.

There is to be found a commentary on "Fat and Politics, a British Warning to Americans," in the *British Medical Journal*, April 20, 1901. It is there stated: "Among 1000 New Yorkers, from the age of 20 upward, over 28 per cent. showed an abnormal development in the abdominal region. In the corridors of a high-class residential hotel the number

of obese individuals in a total of 100 was 70, while in a humbler caravansary the percentage sank to 11. Altogether, among 1500 adults taken at random, 447 were corpulent to the degree of deformity, giving an average of 29.8 per cent."

Our English writer winds up with the following bit of advice: "Those of our American friends who think that the well-being of the United States depends on the maintenance of a republican form of government will do well to take steps at once to repress the tendency to abdominal expansion among their citizens, or they may live to see the President transformed into an Emperor."

This is rather a humorous picture, but it nevertheless has its grave and serious side and is worthy of our most thoughtful attention.

In bringing this brief and, I feel, very imperfect paper to a close, permit me to offer the following convictions, viz.:

1. Overweights, as determined by our present methods, are extra-hazardous and demand special rates on sub-standard rules.
2. We need greater uniformity and unanimity as to what percentage shall constitute a safe maximum.
3. We cannot impress upon the minds of examiners for life insurance too forcibly the vital importance of giving most careful judgments on men of big bulks.
4. And lastly, I believe that Dr. Rogers summed up the whole question when he said: "I think that there is only one conclusion to be drawn from the facts, and that is that *any* company that accepts risks on lives 25 per cent. or more overweight is going to have a high mortality among those lives. From observations of my own, I am able to say with the utmost confidence that high mortality will occur whether they are insured on life tables or on endowment tables, and in spite of the care shown in their selection."

The paper was discussed by Drs. Marsh, Willard, A. S. Knight, Tabb, and Emery. The discussion was closed by Dr. Burrage.

The tellers, Drs. Grant and Fisher, reported that the following ticket had been elected:

PRESIDENT.

DR. EDWARD H. HAMILL.

1ST VICE-PRESIDENT.

DR. JOHN W. FISHER.

2D VICE-PRESIDENT.

DR. THOMAS H. WILLARD.

TREASURER.

DR. FRANK S. GRANT.

SECRETARY.

DR. BRANDRETH SYMONDS.

EXECUTIVE COMMITTEE.

DR. OSCAR H. ROGERS.

DR. GRANVILLE M. WHITE.

DR. EDWARD CURTIS.

Dr. Shepherd made some pleasant remarks and then escorted Dr. Hamill to the chair. The latter expressed his thanks for the honor which the Association had conferred upon him.

It was moved by Dr. Wells that the thanks of the Association are due Dr. Shepherd for the able, conscientious and impartial spirit he has shown as President for the last three years. Carried unanimously.

These essayists were appointed for the next meeting: Drs. Emery, A. S. Knight, and Shepherd.

It was moved by Dr. Wells that in the next edition of the Constitution the list of companies be printed alphabetically with the names of their Medical Directors placed opposite.

It was moved by Dr. Symonds that the thanks of the Association are due the Metropolitan Life Insurance Co. for the extreme courtesy and splendid hospitality which have been constantly shown during this meeting.

The meeting then adjourned.

FOURTEENTH ANNUAL MEETING.

The Fourteenth Annual Meeting of the Association was held on June 4th and 5th, 1903, in the Club Room of the New York Life Insurance Company, New York City, Dr. Edward H. Hamill, President, in the chair.

The following members were present at some time during the meeting:

Drs. Thomas W. Bickerton, Arthur R. Bisbee, Thomas C. Craig, Edward Curtis, G. Pierrepont Davis, John L. Davis, Charles A. Devendorf, Z. Taylor Emery, John W. Fisher, E. L. Fiske, Frank S. Grant, Edward H. Hamill, Edgar Holden, Morris L. King, A. S. Knight, William W. Knight, Joseph Kucher, R. L. Lounsberry, Elias J. Marsh, William D. Morgan, William Natress, W. Evelyn Porter, Oscar H. Rogers, Edward K. Root, H. C. Scadding, Elmer A. Scott, Brandreth Symonds, H. Cabell Tabb, Harry Toulmin, G. A. Van Wagenen, Joseph

H. Webb, Frank Wells, Granville M. White, George Wilkins, Thomas H. Willard, Algernon Woolverton, Albert Wood, Joseph C. Wood. Total, 38.

On roll call twenty-six members, a quorum, were found to be present.

Dr. Edwin Welles Dwight, of the New England Mutual, was unanimously elected to membership.

The minutes of the last annual meeting and of the intervening meetings of the Executive Committee were read, and adopted as read.

The following obituary on Dr. John Homans was then read by Dr. Frank Wells:

"John Homans was born in Boston, November 26th, 1836, and died February 7, 1903. Descended from a family of physicians, his grandfather and father having been distinguished medical practitioners in Boston, he early evinced a desire to follow the profession of his ancestors. With this end in view he entered Harvard College, from which he was graduated in 1858. He immediately commenced the study of his profession in the Harvard Medical School, but before he had received his degree, while yet serving as house officer in the Massachusetts General Hospital, the Civil War broke out. Inspired by an intense feeling of patriotism, he offered his services and was commissioned assistant surgeon in the United States navy. In 1862 he received a commission as assistant surgeon in the regular army, and later served on the staff of General Banks in the ill-fated Red River expedition. He afterwards became surgeon-in-chief of the First Division, Nineteenth Army Corps, and subsequently served as medical inspector on General Sheridan's staff.

"At the close of the war, after further study in Europe, he entered upon his life work as a physician. He received successively the appointments of surgeon of the Boston Dispensary, Children's Hospital, Carney Hospital, surgeon

to out-patients, and in 1882 the appointment as visiting physician of the Massachusetts General Hospital.

"Early in his career, with almost prophetic insight, he recognized the necessity for abdominal operation. Boldly and skilfully, at a time when there was a prejudice against this form of surgery, he operated many times for various diseases of the abdominal organs, particularly for ovarian diseases. His first ovariectomy was done in 1872, and he was one of the first to perform the operation for appendicitis.

"For thirty years Dr. Homans served as Medical Director of the New England Life Insurance Company. In this position he showed calm judgment, great liberality in his decisions, and a skill which was in every way worthy of imitation. By nature he was generous, courteous, and kind to all. A genial companion, his presence was sought at all social gatherings. Dr. Homans was above all the highest type of the American gentleman. He was a brave soldier, a brilliant surgeon, and a skilled life insurance medical director. His friends, whose name is legion, mourn his loss, his army companions have paid a loyal tribute to his bravery and patriotism, his medical associates have all missed his skill and ever-ready assistance, and the community in which he lived will never cease to revere his memory.

"This Association, of which he had been a member for a few years, early recognized his worth and learned to depend upon his experience in life insurance work. We join with others in the expression of our grateful remembrance of our intercourse with him, of our sorrow that he has passed from our midst."

It was moved by Dr. Fisher, and carried, that this memorial be adopted and spread on the minutes, and that copies be sent to the family and the New England Life Insurance Company.

The following obituary on Dr. A. L. Vandewater was read by Dr. Edward Curtis:

"Dr. Albertus Lyman Vandewater, a descendant of an

old New York family, was born in Brooklyn, New York, January 15, 1850. He was educated at the New York High School, and in 1870 was graduated in medicine from the Bellevue Hospital Medical College. He practiced medicine in New York City, Englewood, New Jersey; Brooklyn and Bay Shore, New York. In the year 1882, Dr. Vandewater was appointed medical examiner for Bay Shore in the service of the Equitable Life Assurance Society of the United States, and in 1886 was commissioned a medical inspector in the same service, in which capacity he first inspected the society's business in Central and South America and in Mexico. Later he was assigned to duty in the office of the medical directors, and in 1893 was formally appointed an Assistant Medical Director of the society's staff. May 1, 1897, the Doctor resigned his service with the Equitable to accept a Medical Directorship of the Provident Savings Life Assurance Society of New York. This office he held until his death, which occurred March 2, 1903.

"Dr. Vandewater was a Freemason of high order; was in 1900 Vice-President, and in 1901 President of the Medical Society of Bergen County, New Jersey; was for ten years Secretary of the Medical Board of the Hackensack Hospital, and since 1902 was a director of the Spring Valley National Bank.

"Dr. Vandewater was highly esteemed by us of the Equitable Society. He united to a warm and generous heart a well-ordered and judicial mind. In his death life insurance has lost a wise and skilled medical officer and we, his associates, a true, kind friend."

It was moved by Dr. Wells, and carried, that this memorial be adopted and spread on the minutes, and that copies be sent to the family and the Provident Savings Life Assurance Society.

A letter from Dr. George R. Shepherd was read, expressing regret at his inability to be present, on account of his recent illness. It was moved by Dr.

Rogers, and carried, that the Secretary write to Dr. Shepherd assuring him of the sympathy of the Association in his recent illness and wishes for his speedy and thorough convalescence.

A letter from Dr. James Thorburn was then read, expressing regret at his inability to be present, on account of illness. It was moved by Dr. Wells, and carried, that the Secretary write to Dr. Thorburn assuring him of the sympathy of the Association for his illness and wishes for his speedy and thorough convalescence.

The President then delivered his annual address, reviewing in the first part the work of the Association since its foundation, and in the second part considering the question of Albuminuria at length.

Mr. Darwin R. Kingsley, Vice-President of the New York Life Insurance Company, then addressed the Association, welcoming it and extending to it the hospitality of the company which he represented.

The meeting then adjourned.

The annual dinner of the Association was held at Delmonico's, Thursday, June 4th, at 7.30 P.M., Dr. Edward H. Hamill, President, presiding. The members present were: Drs. A. B. Bisbee, R. L. Burrage, G. Pierrepont Davis, J. Fisher, F. S. Grant, E. H. Hamill, M. L. King, A. S. Knight, W. D. Morgan, W. E. Porter, O. H. Rogers, E. H. Root, E. H. Scott, H. C. Tabb, H. Toulmin, J. H. Webb, F. Wells, G. M. White, G. Wilkins, T. H. Willard, A. Woolverton and A. Wood.

At the conclusion of the dinner the President, after a few pleasant and well chosen remarks, introduced Mr. Kingsley, Vice-President of the New

York Life, who was present as the guest of the Association. In the course of his remarks, Mr. Kingsley urged that a closer relationship be established between the medical and executive departments and field workers. In this manner he held that the old feeling of opposition and friction between these departments had largely been overcome in his company. The importance of such a course was discussed by the various members called upon for remarks. It was urged that in the future lay guests be invited to be present at the Association's dinners, in order that there might be an interchange of views on subjects of interest to both Medical Directors and Executive Staff.

Dr. Tabb extended an invitation to the Association, on behalf of his company, to hold the next annual meeting at Richmond.

SECOND DAY.

The meeting was called to order at 10 A.M., President Hamill in the chair.

The roll call showed a quorum.

Dr. Wells gave notice of the following amendment to Article VIII. of the Constitution:

"The terms of office of the President and Vice-President, as such, shall be limited to two consecutive years, and they shall be ineligible for re-election until five years have elapsed from the date of their last incumbency of the office."

Dr. King gave notice of the following amendment to Article III. of the Constitution:

“One new member shall be elected to the Executive Committee each year, the senior member of said Committee dropping out.”

Dr. A. S. Knight read a paper on

THE SELECTION OF MEDICAL EXAMINERS, AND THEIR FEES.

By what practical methods may we improve the ability, the loyalty, the good judgment, and thus the general efficiency, of the medical examiners in the field?

This topic may appear to be a barren one at first sight, but there are, I am confident, a number of points about it that deserve consideration and discussion by the members of this Association.

The custom is to appoint physicians as to whose honesty and capability we have satisfactory reports, to instruct them as well as has been practicable, and to then depend on their pen-and-ink pictures of the applicants to show either that they are sound and acceptable or else to describe clearly wherein there are impairments and so causes for rejection or modification. Many of these well-selected physicians often hold appointments from several companies, and they are as a body a fine lot of thoroughly able, honest, reputable men, who are a credit to the profession and whose work in the detection of unsoundness and of fraud is of inestimable value to the life insurance companies. We all respect them, and we especially admire those examples of self-sacrifice in the scattered sections, where they travel so far and work so hard under difficult conditions for less total incomes than those in the cities receive. It is not my purpose to belittle these men or to criticise them harshly, but is it not fair to ask, in this age of such tremendous progress in surgery and in

medicine, whether we by our teaching and by our requirements are bringing this staff of medical examiners to the highest possible state of efficiency, whether we are in this way making the best possible use of our resources? It makes little or no difference whether the companies represented here have all or only a very few of them begun to look for new experiences by the selection of risks among impaired lives. It may be true that many of them have not even the slightest intention of entering that field, yet the established fact is that life insurance officials, their agents, and the public at large know or are being taught that some lives, though not sound enough to be accepted for every plan of insurance at ordinary rates, may yet not be impaired enough for absolute rejection by some of the companies and that they may, therefore, apply and be examined for policies in the so-called sub-standard classes.

There is no doubt that medical directors and the executive officers are studying these people carefully, intelligently, and probably conservatively; that they are making selections as wisely as they can, and that they will after a lapse of years get results which will in all probability be satisfactory and which will at least be of the greatest value to their companies.

We all know that the most important and at the same time the most difficult question in these selections is the one of prognosis. Just as it is the desire of a patient and his friends that the attending physicians relieve and cure the sufferer, while they care comparatively little for the fine features of diagnosis and of experimental research, so when the same man or another comes forward as an applicant for insurance, then it is the desire of companies that their medical directors tell them how long this and that group of risks may be expected to live—and they think comparatively little about their past sufferings or the exact diagnosis of their impairments except in so far as they will modify the probable length of their lives. And though the answer must most often be an indefinite one from a medical point of view—though it can only be given by the actuary after a long and large experience—yet while we are getting this experience, while we

are making the best estimate that we can, we are in duty bound to supply the most knowledge obtainable and the best possible results from every branch of our medical forces; and our success will come not so much from the finest, ~~most~~ up-to-date methods of physical examination as it ~~will~~ from the good average ability to detect disease, coupled with a good judgment that is in every-day parlance called "horse-sense."

At a recent medical club meeting where a paper had been read on some medical features of life insurance I was most interested in the after-discussion by the different members, who were practitioners of varying ages and who represented many medical specialties. Many of them had made medical examinations for life insurance, others had as patients those who would not get insured, some posed as experts who testify against life insurance companies when claims are contested—all were interested in the topic of the evening. They were on the whole very fair in their attitude. And I was impressed by the fact that in their criticisms they said much more about the unsound lives who are insured without their impairments having been detected than they did about the rejecteds who ought, in their opinions, to have passed. One man said: "Why, I can call by name over sixty diabetics in this city who are insured and the companies do not know it. I have more than once received \$1000 for treating a man for six months and then he got insured all right." Another surgeon told of his patient who had cut his thumb recently and who, while he was still wearing a cot, applied for and obtained \$25,000 of insurance. Inside of six weeks he was dead with sarcoma of that thumb, and he would never have been accepted if the wound had been carefully scrutinized at the examination. These remarks were followed by others that emphasized the frequency with which doubtful or unsound risks go or are brought by unscrupulous agents to scrupulous or unscrupulous physicians for examination and for treatment before they apply for their policies. No doubt their ailments are often by this means so covered up by their deliberate lying to the examiners, about their existence and

about their previous medical attendance, that it is impossible at the moment to lay them bare by any means in our power. Fortunately, however, inquiries through commercial agencies or by inspectors from the home office will many times disclose facts that were never suspected by our physicians, and so lead to their rejection; but do not these suggestions emphasize a fact that, while the examiners are honest and capable in their handling of straightforward applicants, yet that in dealing with the fraudulent, the unfair, many of them do not display the acumen, the searching resourcefulness, the all-round keen judgment that they ought to have and that they would get under some kind of training that would inform them on all features of the business from the expert layman's as well as from the medical point of view?

How many of the examiners in the field can think intelligently about questions of moral hazard and can apply those thoughts intelligently to the risk in hand? How many of them can nicely estimate questions of grade and of eligibility for only some other plans of insurance than the one applied for? How many of them in passing upon women will not only make a thorough physical examination, but also consider correctly the questions of insurable interest and of adverse selection that are involved?

We all know how implicitly the report of a trusted inspector from the home office is accepted as true and final, and yet how often the same findings from this or that commercial agency would be doubted. In the same way we know how quickly the business executives accept as final the results of an examination by one of the home office physicians, while they are constantly in doubt about some features of the reports from examiners in the field. There must be reasons for this condition. The scores of men living and well to-day who were refused 20 or 30 years ago show that the result of taking a purely medical decision has not always in the past been entirely satisfactory, but so would the scores of deaths of those who never ought to have been accepted, because we are all human and fall short of perfection; but these cases do not explain fully why lay executive officers

scrutinize and pass controlling judgment on many complicated cases after the medical division has recorded its findings.

I think that the solution is to be found in their not having the same faith in commercial agencies that they have in their own inspectors, the same confidence in the broad judgment of the field examiners that they have in those physicians who have been trained in the innumerable features of the business at the home office, and I believe that the needed improvement can be made by a more thorough, broader teaching of those medical examiners.

The ideal way would be to have business enough in each locality so that a satisfactory salary might be paid to good physicians who chose to give *all* their time to this special work, and then after training them for six months at the home office to send them back to the field where they are to live. Such a man would be strong in his protection of the company's interests, and at the same time of inestimable help to the honest field-workers and to the community in which he lives. Naturally such an arrangement as this can only be carried out in the large cities, where good volumes of business are sufficiently concentrated. It has not and will not pay to hire cheap men who for a small sum are willing to give up every other chance to practice medicine. Their ability as well as their ambition is inferior at the start, and they are not likely to ever do work of a high order.

Where the territories are too scattered for this constant employment, then I think that the examiners should be taught and counselled at conferences and at general meetings much more than they have been. They should by an acquaintance with the medical directors and with other officers at every opportunity learn thoroughly about all the features of the business which have bearings on their work—knowledge that will help them in rounding out their estimates of the risks and in their recording of good expressions of judgment. Then they would not think, as many of them do now, about life insurance companies with their millions of assets growing so rapidly year by year that financiers look on in wonder and can hardly comprehend the size of the figures or begin

to forecast their future growth—they would not think that out of these vast accumulations death claims and other expenses can be paid at will without any missing of the money. They would realize that instead of being gold mines at the central offices out of which unlimited payments can be made, instead of being vast piles of profits, these accumulations are really the most sacred of trust funds, which are to be guarded honestly, prudently, and safely in the interests of the policy-holders who really own them. They would see and hear how fairly, generously, and willingly all just claims are paid; how conscientiously these trust funds are really guarded; how fraud is detested and fought—and they would thus get a different appreciation of the whole business of life insurance than they could ever learn by their own researches.

It is true that such well-equipped, broad-minded examiners are now to be found in several of our cities, but how they do stand out with their heads and shoulders away above the general average!

There is one subject about which I think that this body should not only deliberate carefully, but in reference to which they should now or in time approve and adopt some uniform views—and that is the matter of medical fees. It is not right for good physicians holding commissions in several companies to curse one, praise another, and to look suspiciously and jealously at all of them simply because they get fees all the way from \$3 to \$5, or even \$10, for the same amount and class of work. There should certainly be a uniformity in these allowances. One company can afford to pay practically the same amounts that another can, and it is for the interests of all that they do so.

I am well aware that some who believe that their medical fees have been too large are cutting them down by the payment of stated monthly salaries, which give the examiner a definite income irrespective of the number of examinations he may have to make, the only definite requirement of him being the number of hours that he must spend each day at the local office. No doubt the companies thus get their

medical work done for a less total expense than formerly; but I believe that the plan, instead of being ideal, tends to upset ambition, loyalty, and contentment, and that it is based upon an entirely wrong principle. If there is one peculiarity that stands out emphatically in this country it is the desire of every honest man, no matter what his station in life, to get a fair pay for what work he does. You have in your payments to agents a system that may well excite the envy of every other business man—a fair percentage is allowed to them as commission and the earnings are limited only by the intelligence and by the activity of the agents themselves. The system is most fair, and the dangers of labor unions and walking delegates amount, therefore, in our business to almost nothing. Why not then under the same principle assign definite sections for visiting and definite hours at the local offices to the different medical examiners, and then pay them a fair fee and only a fair amount for each examination; and at the same time allow them to send their reports direct to the home office without having their confidential findings viewed by the local agents? Then they will receive no more and no less than they actually earn.

They may not be complaining loudly at the present plan of monthly payment, but I am confident that they do not like it, and that they simply keep quiet because they do not wish to resign. I believe that many of them are discontented and that their loyalty, their ambition, and their energy are thus strained. Moreover, if this plan should give satisfactory results in the cities, it is not applicable to the smaller localities, where examinations are relatively infrequent.

The question of saving in expense by the companies is part of this problem, but it is by no means all of it, and it is no answer to say that in some few places we can unfortunately find only some unprincipled, narrow-minded apologies for physicians who are trying to fleece us of all they can. This monthly system of payment is not applicable to them, because it is only in force in the larger places, where a sufficient volume of business is being written; and there out of the numerous respectable, honest physicians we select our men.

They are gentlemen, and we as gentlemen dealing with them ought not to enforce a plan which will fail to work fairly in both directions. By the fixed monthly salary plan all cannot go on an even keel, because either the company or the doctor will lose or win by there being a larger or smaller number of examinations than was estimated. Is it fair for the company to be in a position where it can say, If the doctor wins, then we will change the salary, but if the company wins, then it will stay just where it is? I think not.

With the small amounts of many policies, the certainty of at least 50 % of early lapse before the business has paid for itself, a universal fee of \$5 is too large; but would it not be fair and best for all to require a urinalysis in every case and to then pay \$3 where the amount of insurance applied for is \$2000 or under, and \$5 where it is for \$2500 or more? These fees impress me as equitable for all parts of the country; for, while it might be said that the country physician would thus get more and the city practitioner less than his usual fees in general practice, yet we must remember that the latter makes many more examinations than the former and that his total receipts are, therefore, much larger. Nor should it be overlooked that the country physician has generally greater distances to cover, with less conveniences to do so, than his brother practitioner in cities; and that furthermore he often proves to be the most intelligent and most loyal of all in our employ.

Whether these sums are too large or too small is a question for all concerned to determine, but it does seem that this important matter should be discussed until a decision shall be reached, and that we should then if possible all adopt the same schedule.

I hope that my suggestions and criticisms will not be misunderstood, for they have not been made in any spirit of harshness, and the whole purpose of this paper is simply to promote free and fruitful discussion. We all have many duties of responsibility to perform towards our companies, towards our policy-holders, and towards our faithful medical staffs. We must together try to solve the problems amicably,

efficiently, and correctly, and I hope that you will thresh out this fee question to a settlement.

I do not believe and I never have thought that a business official uninformed in medical knowledge can with safety make decisions where complicated medical questions are at issue and where a proper understanding of them is essential in estimating the probable expectation of life; yet we must all have deliberated seriously and thoughtfully over the fact that when it comes to a consideration of *all* the features presented by applicants—questions of business policy, of moral hazard, of previous histories and present conditions modified by former or existing common diseases, in short, in a deliberation upon the whole problem in front of them—these lay officers show by their actions that they have studied carefully, that they have mastered the results of experience, that they can pass judgments which are reasonable, and that they seek and give proper consideration to the medical features involved as well as to the business aspect. Cannot we, then, by teaching our medical examiners all along the lines that I have indicated, develop them into a body of men who, seeing the risks at first hand in the localities where they are best known and viewing them from every business as well as from every medical standpoint, can make broad, comprehensive estimates of their whole worth as life insurance risks to a degree that is not now known and to the end that they will indeed be a most important, most valuable factor in the conduct of our business? I believe that this can and will be done, and that we, as medical directors, have many duties in these directions.

This paper was discussed by Drs. Wood and Rogers.

Dr. Craig read a paper on.

THE CLINICAL SIGNIFICANCE OF TUBE CASTS IN THE URINE.

The subject of the clinical significance of tube casts in the urine is one which to every physician is very important.

Ever since the discovery of Dr. Bright, pathologists have been endeavoring to harmonize the clinical aspects of the urine with that of the kidney lesion. Tube casts have not inaptly been named "the messengers from the kidneys." Certain it is that we ought to be able to recognize some of the kidney lesions by the evidence given by an examination of the urine.

The kidneys are compound tubular glands and their function is to remove from the blood *débris* that is no longer of any use to the economy, or that may be poisonous to the tissues if retained and allowed to accumulate. It is not my intention, nor have I the time, to enter into the anatomy or physiology of the kidney. It has been abundantly proven that the kidneys do remove much poisonous material from the blood, and you are perhaps familiar with the experiments of Bouchard in this direction, who states that the urine contains seven toxic substances; two of these are endowed with the property of causing convulsions, another causes contraction of the pupil, another reduces heat, another is sialogenous in its effects, another is narcotic, and another one is diuretic, and this last substance is probably urea. Urea is toxic only in very large doses, hence we are led to believe that the injurious effects are produced by the substances other than urea. Drs. Hughes and Carter, in a series of experiments, some years ago, showed that it was not the non-elimination of the urea that caused diseases, but that there was an accompanying poison which was retained in the blood and thus produced the disease.

These organs, thus being the great strainers of the blood, allow to percolate out many things poisonous and non-poisonous.

This is well exemplified in many of the continued and eruptive fevers and in many of the diseases in which a virulent toxin is formed, for we often find in these diseases that the excrementitious material is of such a character as to irritate the delicate renal tissues to the extent of causing an albuminuria and in some cases a chronic inflammation, with the result of our finding tube casts in the urine.

The toxins from the infectious diseases or the irritating materials resulting from a faulty metabolism in the digestive process or the constant presence in the vascular system of foreign substances, if continued for too long a time, will surely set up a congestion which in its turn may lead to chronic structural changes in the vascular and renal systems.

The dividing line between the acute process and the chronic condition is never sharply drawn. We cannot tell where one ends and the other begins. The whole thing resolves itself into a question of time, but it is often difficult to tell when an irreparable damage has been done. It is only by constant and repeated investigation of the case that we are finally able to observe the albumin and casts to disappear in these cases, the hypertrophy of the heart to subside, and the increased arterial tension give way to normal tension. Some writers on renal pathology claim that the primary lesion, in cases of nephritis, is the glomerula and that the tubular portion of the kidney is secondarily involved. Hence, it is in these cases that we almost invariably have an albuminuria as the first renal symptom, but as soon as the disease has advanced far enough to affect the tubular structures we have the cast formation.

It is but reasonable to suppose that substances so foreign to normal tissues would cause changes in them, and thus it is that we have renal disease established.

Writers of the past and of the present are not yet agreed as to what is the exact material which enters into the formation of urinary tube casts.

“Three chief views have been held as to their nature and mode of production:

“First, that they are the result of disintegration of the epithelium of the renal tubules, the resulting products becoming packed into moulds by the pressure of the urine, until at length they slip through the smaller convoluted into the large straight tubes and appear in the urinary sediment.

“Second, that they consist of a secretion of the morbidly irritated epithelium lining the renal tubules, which become caked into moulds and are washed down with the urine.

"Third, that they consist of coagulable elements of the blood which gain access to the renal tubules through pathological lesions of the latter, and that any free or partly detached products of the tubules become entangled in this coagulable product, assisting to form the moulds of the tubules, which subsequently appear in the urine as casts."—(PURDY.)

This last view is the one most generally accepted; at least, it will serve to explain the formation of the more common casts.

Whatever view or theory we accept, the main point is, whether the condition of the kidneys is such as to be permanently injured, or whether they are such as to regain their normal structure: the one great cardinal point to the patient and physician is to find out the trouble and cure the disease.

One is often asked the question, Are tube casts always indicative of kidney disease? I can only give you my own individual opinion on this point by saying that, it depends on the character of the cast found and its permanency in the urine. Formerly we were taught that the simple finding of an innocent-looking hyaline cast was an infallible sign of Bright's disease; but we know, at present, that this is not so unless accompanied by other confirmatory symptoms. Hyaline casts are frequently found in the urine of healthy persons, but this presence can generally be explained by error in diet or drink or exercise. Under these conditions they soon disappear. Then, again, we know that hyaline casts are found in the majority of cases of persons over fifty years of age who lead a strenuous life; and quite frequently in the urine of persons much younger who pursue an occupation demanding extreme muscular and mental fatigue.

Then, again, we must not forget that hyaline casts are extremely common in senile degeneration of the kidneys in persons over sixty years of age; yet in many of the above-mentioned cases there is no trace of albumin present, and no sign of disease evident, and the person lives on to advanced age.

DIFFERENT KINDS OF CASTS.

Cast^s are classified according to their composition and size. A simple division is as follows: The hyaline cast, the waxy cast, the fatty cast, the blood cast, the epithelial cast, the leucocyte cast, the bacterial cast, the crystalline cast, or that composed of crystals which have arranged themselves in a cast-like shape, and the mucus cast or cylindroid. Their mode of formation is as follows: When the material composing them is exuded into the kidney tubules it solidifies and then contracts and is washed down by the urine. If the formation has taken place in a narrow part of the tubule, we have the small hyaline cast; if the epithelium of the tube is loosened, this may adhere to the cast and will then form an epithelial cast; if the epithelial lining of the tube has already been detached, we will then have a medium-sized or large hyaline cast, being the diameter of the original size of the tubule plus twice the thickness of the epithelium. If there were blood corpuscles present and they adhered to the cast, or if the blood was in sufficient quantity to fill the tubule and thus form a mould, then we will have a blood cast. If leucocytes are present and adhere to the cast, we have a leucocyte cast; and in the same way may have a bacterial cast formed. When the material is quite solid in appearance and resembles molten wax, we have a waxy cast formed. Sometimes crystals aggregate into cast-like bodies.

When the tubules contain disintegrated epithelium or disintegrated blood cells and this material becomes incorporated in the cast, we have formed the granular cast; and thus it happens that we have the slightly granular, the moderately granular, and the highly or darkly granular cast.

Any of these casts may also be stained by the presence of bile or blood pigment.

We frequently find mucus casts or cylindroids in the urine. They are mucus moulds of the uriniferous tubules and differ from true casts by their great length, unequal diameter, and fibrillated appearance. Occasionally they have adhering to them granular débris, such as urates or phosphates. We find

them in highly acid conditions of the urine and generally when the specific gravity is high; and also in cases of irritation of the bladder, where the process has extended along the ureters to the kidneys, and also in passive renal congestion.

Casts are produced by irritation and by inflammation of both a high and low grade intensity. Anything which will bring these things about will produce casts in the urine. Thus a highly acid condition of the urine with concentration, the toxins of bacterial origin, the poison of syphilis, the ingestion of alcohol, lead, phosphorus, cantharides, turpentine, and many other substances will produce casts in the urine, and it has been said that the modern use of coal-tar products are largely responsible for many cases of renal derangement, and the subsequent appearance of urinary tube casts.

Casts in the urine show that inflammatory changes are going on in the kidney structure, and it is according to the length of time these inflammatory changes continue that the resulting condition of the kidney will be.

In many of these conditions the brunt of these inflammatory changes does not cease with the kidneys, but is made manifest in many tissues of the body, principally in the arterial system and in the increased growth of connective tissues in the intercellular spaces, thus giving rise to cirrhotic conditions and arterio-sclerosis.

Nature always tries to protect herself, and when she becomes conscious that these irritating, poisonous materials are circulating in the blood and there being brought into contact with the delicate endothelial lining of the blood-vessels, and also into contact with the highly delicate and sensitive epithelial lining of the uriniferous tubules, she begins to safeguard herself by increasing the thickness of these epithelial cells and increasing the amount of the connective-tissue stroma and thus tries to barricade herself against a substance that is repellent to her. Under these varying conditions of low grade and active inflammatory processes, we find the kidneys undergoing certain and well-known changes, and in these changes certain modifications take place in the cell

structure, and accompanying this we have the urinary tube casts formed.

The following are the diseases in which renal casts are commonly found in the urine:

- Simple pyrexia.
- Acute and passive renal hyperæmia.
- Acute parenchymatous nephritis.
- Chronic parenchymatous nephritis.
- Chronic interstitial nephritis.
- Suppurative interstitial nephritis, or, as it is commonly called, surgical kidney.
- Amyloid degeneration of the kidneys.
- Cystic disease of the kidneys.
- Renal tuberculosis.
- Renal cancer.
- Renal calculus.
- Renal embolism.
- Uremia.

Diseases accompanied by a pyrexial condition, such as:

- Typhoid fever.
- Diphtheria.
- Scarlet fever.
- Typhus fever.
- Cholera.
- Yellow fever.
- Small-pox.
- Pneumonia.
- Pulmonary tuberculosis.
- Rheumatism.
- Acute and chronic gout.
- Erysipelas.
- Tonsillitis.
- Hæmaglobinuria.

We must not lose sight of the fact that some form of nephritis may succeed renal congestion in any of these diseases.

Thus, pneumonia is frequently complicated by a nephritis, and the prognosis is then very grave, 45 to 50 per centum of the cases proving fatal. In some cases of pneumonia this renal complication sets in, and then there is a retention of the pneumotoxin in the blood, and as a consequence a hyperpyrexial state ensues.

The urine should always be sedulously watched in this disease for this complication. Amyloid degeneration of the kidneys is more or less common in cases of chronic pulmonary tuberculosis.

In pregnancy a renal congestion may go on to a nephritis.

Scarlet fever is generally accompanied by renal changes, and these may vary with the severity of the case, the toxin in some cases being more irritating than in others.

Simple as it may seem, dietetic errors often give rise to renal tube casts, and these in proportion to the kind of food taken and the duration of such error. Indeed, I think it is an accepted fact that more cases of chronic interstitial nephritis are due to dietetic errors than to any other cause. Foods that are rich in the purin bases or nuclein and nucleic acid, which go to form uric acid, are particularly apt to give rise to disturbances which compel a constant renal congestion, and which, if continued long enough, end in a chronic inflammatory condition which oftentimes is permanent. These conditions are most always accompanied by the presence of renal casts in the urine.

As a working basis we conveniently divide casts into groups, as the cylindroids, the hyaline casts, the granular casts, the epithelial and blood casts, the waxy casts, the leucocyte and bacterial casts. The mucous cylindroids are always the first to appear in cases of irritation and passive congestion of the renal tissues, and are generally regarded as showing only a temporary cause. They are often spoken of as false casts, in contradistinction to the true casts.

The hyaline casts are always the first true casts to appear in any disease, for they are the indicators of commencing irritation or congestion of the renal tubules. With this beginning congestion we find the small clear hyaline cast; and

as the disease progresses we find these casts, in some cases, early beginning to be slightly granular, or simply granular in one portion of their extent.

This granular material is not broken down renal tubule cells, for in these cases the tubules have not exfoliated their epithelial linings, and, moreover, we never find any epithelial casts present; besides this the size of the casts indicates a small mould for their formation.

I think that the granularity must be due to some deposition of the more insoluble urinary salts on them, such as urates produced by falling out of solution in highly acid conditions of the urine, and thus being in position to readily attach themselves to the soft, easily impressionable small hyaline cast. It is more than probable that this takes place after the urine leaves the kidneys; possibly it takes place in the pelvis of the kidney or in the ureter or in the bladder. It is not at all uncommon to find these small, slightly granular hyaline casts disappear entirely from the urine in the course of a few days or weeks. They would therefore represent a temporary condition of derangement.

When we come to inquire into the presence of the medium-sized hyaline casts the case is very similar to the one which produced the small hyaline cast. The renal tubes differ in their calibre in different parts of their course, and thus we have explained to us why we have a medium-sized hyaline cast, and when it is granular or partly so we account for it as we did in the case of the small hyaline cast. With the presence of the large hyaline cast the case is different, their presence is much more significant. The large hyaline cast is formed in the tubules only after the epithelium lining them has disappeared. This exfoliation may take place by the epithelium itself becoming detached and being washed away by the urine, or, as was previously explained, a hyaline cast may form and the cells become attached to it, or the cells may undergo a granular degeneration in situ and thus enter into the formation of the cast, thus producing a granular cast. In either case the renal tubule is stripped of its epithelium, and we thus have a large tube for the subsequent

formation of large hyaline or waxy casts. It is thus seen that the presence of a large hyaline cast or a large granular cast, in the urine, is of much more importance than the presence of the small or medium-sized ones were. In like manner the presence of a waxy cast or an epithelial cast becomes more important. Blood casts represent an acute process, or an acute process engrafted on a chronic condition. Whenever the heart is strongly forcing the blood into the renal capillaries, and a condition exists which impedes the ready outflow of the blood into the renal veins, we are liable to have a rupture of some of these capillaries, and as a consequence a renal hemorrhage. A hemorrhage may also take place when the kidney is invaded by a malignant growth, which breaks down or undergoes an ulceration. Before the hemorrhage actually takes place we have the appearance of blood disks in the urine. These sometimes become attached to hyaline casts, in a like manner to the epithelial cells, and thus is produced the hyaline blood cast. The hemorrhage is sometimes so severe that the blood disks themselves form solid moulds of the renal tubules. Blood casts are thus indicative of renal hemorrhage.

In cases of suppurative kidney disease hyaline casts may have embedded in them or attached to them numerous leucocytes and thus give evidence of a suppurative process in the renal tissues. As was previously mentioned, bacteria sometimes are found held together in cast-like forms, and their presence in the urine is regarded as giving evidence of septic suppuration of the kidney tissue, such as embolic abscess. It is important not to confound the true bacterial cast with the loose agglutination of bacteria that is sometimes seen in decomposing urine.

When an epithelial cast remains in the tubule for some time it occasionally undergoes fatty degeneration, and we then have a fatty cast result. These casts are generally present in old standing cases of chronic parenchymatous nephritis, and are looked upon as showing a chronic inflammatory condition—the large white kidney.

As we have before intimated, renal troubles are the result of congestion or of inflammation, either acute or chronic, and

it is to these latter conditions that the term nephritis is applied. In this term nephritis is implied a loss of balance between the stroma and the cells. In the slowly developing cases we have the stroma in excess, while in the acute cases the reverse is true.

In trying to arrive at a correct conclusion we must take into consideration other factors, such as the habits of the individual, the onset and course of the disease which preceded the renal manifestation, the remedies which have been employed, for it is a well-known fact that remedies sometimes cause renal disorder or give rise to accompanying symptoms such as albuminuria, and thus confuse a correct deduction. Then, again, the condition of the heart, whether hypertrophied or not, whether valvular disease exists or not, whether valvular sounds are exaggerated or not, and whether the arterial tension is increased or not, will all have an influence to aid us in arriving at a correct conclusion.

Further, we must bear in mind that a previously chronic renal trouble may have engrafted on it an acute exacerbation, as, for example, where an acute parenchymatous nephritis complicates an old chronic interstitial nephritis. This may seem paradoxical, but is very possible when we call to mind the fact that in some cases only one kidney is diseased, and then only in limited areas, leaving other areas of apparently normal tissue, and it is these areas that are then attacked. Again, the urine at different times of the day may show widely different results, and for this reason a mixed twenty-four-hour sample is always the best for examination. It has been claimed by some observers that it is always necessary for albumin to be present in the urine in order to render the presence of casts of serious import. Albumin is present in the acute and more marked renal troubles, but in some of the chronic disorders it is sometimes intermittently absent, or is only found in the sample secreted after the wear and tear of a day's toil.

While it is true that some writers have recorded cases of both acute and chronic renal disorder in which albumin was absent from start to finish, yet these cases are exceedingly

rare, and the true renal lesion can then only be decided by other confirmatory symptoms. One author, who has a national reputation as a writer and teacher on renal troubles, makes the following statement in the last edition of his work: "While large albuminurias of renal origin can scarcely be due to anything else but renal disease and the degree of albuminuria is, within limits, a measure of the extent of the disease, yet the important fact remains that there may be true albuminuria, usually moderate, in which there is no disease of the kidneys whatever; there may also rarely be Bright's disease in which there is no albuminuria whatever. The significance of albuminuria is always increased by its association with tube casts, yet there may be both albumin and casts in urine where there is no Bright's disease, while on the other hand there may be Bright's disease without albumin or casts. I incline myself to the belief that such cases are infrequent, and yet this possibility must be acknowledged."—(*Tyson's Practice*, p. 671, ed. 1900.)

Strumpel says, in his latest edition: "It is not very exceptional for sore throat, particularly follicular tonsillitis, to occasion acute nephritis, and the same is true of acute intestinal disease."

Another writer has said that "albumin and casts are not infrequently due to torsion of the vessels at the renal hilum by mobility."—*Medical Annual*, 1902, p. 377.

I am conversant with a case in which a uterine tumor, by pressure on the ureter, gave rise to renal congestion, with the result of albumin and hyaline casts in the urine. After the tumor was removed the albumin and casts disappeared.

So we can readily see that, as was previously stated, other facts must be taken into consideration in the interpretation of the significance of casts in the urine, even though albumin may or may not accompany them. In trying to decide if one or both kidneys are involved in disease, some practitioners carry their investigations to the extent of securing the urine from each kidney separately by means of catheterizing the ureters and thus eliminate from consideration the kidney that is not diseased. Sometimes the presence of casts

is overlooked in our examinations, though not intentionally, but from the fact that they are sparsely present, and we happen to get hold of and examine a portion of a specimen which does not contain any of them. For this reason it has been my practice to concentrate the sediment in all specimens in which it is small in amount.

This is readily done by filtering a certain quantity and then puncturing the apex of the filter and washing the residue into the centrifugating tube. In this way casts are frequently found that would otherwise be overlooked.

We occasionally meet with cases that are difficult to reconcile with the facts shown by a urinary examination.

I have under observation at present a gentleman of healthy appearance who leads a very active and strenuous life as president of a large company. He consulted me nearly three years ago on account of a constantly recurring sub-occipital headache. No cause for the headache has yet been found, eye strain even being eliminated, although they very seldom recur now. He had a highly acid urine, which contained and does yet contain an abundance of cylindroids, small and medium-sized clear hyaline casts. Repeated examination, extending over nearly three years, has never shown any trace of albumin present. His habits are exemplary and always have been so; there is no hypertrophy of the heart, nor any increase of the arterial tension. For a long while I have had him on a diet sparse in nitrogen, so as to reduce the amount of uric acid as low as possible, with the idea that a uric-acidæmia was the cause of the headaches. He appears to be in the very best of health, save for the occasional headache, but yet there are plenty of hyaline casts in his urine.

About a year ago I examined the urine of a person aged about forty years, which contained quite a number of small hyaline casts, many of them being quite granular. Another examination of this same person's urine, made ten days later, showed it to be perfectly free from any kind of casts. I then learned that this person had been suffering from a sharp tonsillitis at the time of the first examination, and that this condition had subsided some days prior to the last urinary

examination. At no time was there any albumin present. A medical gentleman of this city, and a former member of this society, had been the subject of a chronic interstitial nephritis for some years. He suddenly became incapacitated for work. The urine showed blood, albumen, small and large hyaline and granular casts, and in addition epithelial casts. This was a case of an acute parenchymatous nephritis setting in as a complication to a chronic interstitial nephritis. What had been the remaining healthy tissue in the kidney was suddenly attacked by an acute process, and the disease ended fatally.

A gentleman about sixty years of age, one of the proprietors of a large store in this city, applied for life insurance, but was declined on account of the presence of a few medium-sized clear hyaline casts in his urine. There was no albumin present. He is hale and hearty to-day, without any sign of disease, and has not missed a day's work in years. This is a case of senile degeneration of the kidney structures, due to advancing years. Quite recently I examined a person about fifty-two years of age for life insurance; his urine showed the most minute trace of albumin, by one of the more delicate tests, but no casts or renal epithelium were found. I kept him under observation and the following week found a like trace of albumin and one medium-sized hyaline cast; a few days afterwards another urine examination showed quite a trace of albumin. His complexion was not healthy, being a pale waxy white. There was no cardiac hypertrophy or increase in the arterial tension present, yet I am certain that this was a case of commencing interstitial nephritis. I might add that this gentleman's father died of Bright's disease, and that his mother died of apoplexy—probably of nephritic origin.

These cases are what we call "border-land cases," and it is on their early diagnosis and subsequent treatment that their longevity depends. In marked contrast with these cases is one which I examined recently—a man about thirty-eight years old, amount of urine in 24 hours 40 ounces, containing 468½ grains of urea, a large per centum of albumin. The microscope showed quite a large number of small, medium-

sized and large hyaline casts, quite a number of small round epithelial cells from the renal tubules, a few waxy and oily casts, quite a number of darkly granular casts, and an occasional epithelial cast. I learned that this gentleman had been suffering from renal trouble for some time, but had lately been indulging rather freely in the wine cup, and as a consequence was laid up for repairs. This case, to my mind, was an old interstitial nephritis which had lately had engrafted on it, as a complicating factor, an acute parenchymatous nephritis—probably as a result of his own over-indulgence in alcohol.

This case ended fatally about three months afterwards. The significance of the tube casts in this urine was quite apparent.

The question of the hereditary tendency of nephritis is one which clinical writers are paying more attention to now than formerly. In the latest edition of Tyson's *Practice* he says: "Hereditary influence is occasionally a cause of contracted kidney. A remarkable instance of this has occurred in my own practice. I was consulted by a man, aged thirty, who had granular kidneys. His father and mother both died of Bright's disease, aged fifty-six and sixty-three years respectively. The mother had convulsions. A brother died of Bright's disease without convulsions, at the age of thirty-seven. Two children of this brother had Bright's disease when four and seven years of age respectively. A second brother died at the age of twenty-nine with convulsions. A third and fourth brother, aged twenty-three and thirty-two years respectively, have had Bright's disease for six years.

"A sister, aged thirty-six, has had Bright's disease for five years. A brother aged twenty-six and a sister aged thirty-four have as yet exhibited no signs of Bright's disease. A maternal cousin died of undoubted Bright's disease, and other members of the family belonging to previous generations died with symptoms which suggest Bright's disease. The patient himself has undoubted granular kidney, discovered in 1880. An examination of his urine in 1876 revealed no evidence of the disease. There is no gout in the family. Dr. Dickinson also relates the history of a family

in which a hereditary albuminuria existed independent of gout."

I am personally acquainted with a young man of thirty-two years of age whose father and paternal grandfather died of Bright's disease, and who now has albumin and hyaline casts in his own urine, thus possibly showing an hereditary tendency to renal trouble.

Quite recently I examined the urine of a young man about thirty-two years old. The day before he had taken a very rough horseback ride. His urine was reddish brown in color, of high specific gravity, heavily loaded with urates. Chemically it contained three-quarters of one per centum of albumin, and the microscope showed quite a number of small and medium-sized hyaline casts, some of them darkly granular. Another examination of this person's urine three days subsequently showed the complete disappearance of albumin and casts, and a third examination, a few days afterwards, was negative so far as the presence of albumin and casts were concerned. I merely quote this to show how rapidly and how completely these abnormal bodies may disappear from the urine. I always regard with suspicion the case of a young person with tube casts in his urine, even when albumin is absent and there is no disease present to account for the casts, and an old person with albumin in his urine, even when casts are absent and there is no disease present to account for the albumin.

"Casts are rarely found in alkaline urine, no matter what renal lesion exists. In surgical kidney, so-called pyo-nephrosis for instance, the urine rapidly undergoes ammoniacal decomposition, rendering it alkaline, and casts are seldom found therein, although the renal changes are very grave."—Purdy's *Bright's Disease*.

The albuminous-like material which forms the basis of nearly all urinary casts seems to be dissolved by some inherent solvent in an alkaline urine; hence it is that in suspected cases, where the urine is persistently alkaline, we must adopt a line of medication which will render the urinary secretion acid, and we will then be able to secure a specimen with the casts intact.

As was previously mentioned, I cannot too strongly urge on my hearers the necessity of concentrating the sediments in all specimens by means of filtration, thus striving to obtain all the elements it contains, and of examining slide after slide until we are confident of having observed all of the physiological and pathological elements contained in it, and then by a close study of these, and by a proper classification of them, I am positive that a much clearer understanding can be reached. In this connection I would like to call attention to the very common, but erroneous, practice of many medical examiners using high-powered objectives in urinary microscopy. A two-third inch objective will find all the casts in any specimen, a one-fifth or one-sixth inch only being used to differentiate and study the finer structures in detail.

Another point is to use a mechanical stage so as to be able to search every part of the field systematically. In obtaining the sediment for examination centrifugating is the only true, safe, and accurate method to depend on for reliable results.

When an albuminuria accompanies casts, the significance of the latter is always of much more serious import. Indeed, I might say that albumin will always be found in company with casts, sooner or later, in all cases where there is serious organic renal change going on.

I think that albumin is often overlooked in urinary examinations because it is not carefully sought for, or is not sought for with enough persistence or under favorable circumstances. Examinations for albumin should always be made in clear daylight, and never by artificial light. Of course, in all cases it will be necessary to determine whether there is present a true renal albuminuria or false albuminuria, and this can only be done by excluding all those causes which give rise to false or extra-renal albuminuria.

How are we to decide, then, in those cases where we find tube casts present in the urine, whether accompanied by an albuminuria or not? As I have already intimated, we must examine carefully the character of the cast as to the size and kind, we must look at it with both low and high power and search it for granularity, for adhering blood or pus corpuscles

or bacteria. We must decide whether it is hyaline, waxy, oily or fatty. We must also study the character of the epithelial cells present and decide whether or not they are from the renal tubules; we must also examine them minutely to see whether they are clear or granular or fatty.

We must also look for the presence of free pus corpuscles and free red blood disks and bacteria, for it is a well-known fact that bacteria will soon disintegrate and destroy some of the more delicate hyaline casts in quite a short time—hence it is always important to examine freshly voided urine for diagnostic purposes.

A urine voided late in the afternoon always gives better results than that passed on rising in the morning. To obtain the most satisfactory results it is best to examine a mixed sample of the twenty-four hours' urine; then we are able to obtain a better index of the working power of the kidneys, and any abnormal product that may be present during that time is more certain of detection. With the twenty-four hours' sample we are also able to calculate the amount of urea, uric acid, chlorides, phosphates and sulphates voided, and also to examine for indican and acetone. Repeated examinations will also tell us whether these things are constantly present and in varying numbers and amounts. In addition to this should be a critical search for the presence of albumin and casts. With these facts before us, and knowing the habits of the individual, his age, the condition of his heart, arteries and abdominal organs, we ought to be able to arrive at a reasonably accurate conclusion in regard to the significance of the tube casts in the urine.

Discussion of Dr. Craig's paper followed, participated in by Drs. Wells, Bisbee, Symonds and Fisher.

The tellers, Drs. Tabb and John L. Davis, reported the results of the election as follows:

PRESIDENT.

DR. EDWARD H. HAMILL.

1ST VICE-PRESIDENT.

DR. JOHN W. FISHER.

2D VICE-PRESIDENT.

DR. THOMAS H. WILLARD.

SECRETARY.

DR. BRANDRETH SYMONDS.

TREASURER.

DR. A. S. KNIGHT.

EXECUTIVE COMMITTEE.

DR. OSCAR H. ROGERS.

DR. EDWARD CURTIS.

DR. ELIAS J. MARSH.

Dr. Rogers exhibited a very ingenious mailing tube of celluloid for the transmission of urine through the mails.

The discussion of "Indications for Selection" was resumed from the last meeting.

It was moved by Dr. Tabb that the next annual meeting be held at Richmond, Virginia, which motion was carried unanimously.

It was moved by Dr. King, and carried, that the time of the annual dinner be left to the Executive Committee.

It was moved by Dr. Tabb that the thanks of the Association are due to the New York Life Insurance Company for its splendid hospitality and cordial reception. The motion was carried.

It was moved by Dr. Wells, and carried, that President Hamill be congratulated on the impartial and businesslike way in which he has carried on the work of the Association.

The meeting was then adjourned *sine die*.

FIFTEENTH ANNUAL MEETING.

The Fifteenth Annual Meeting of the Association of Life Insurance Medical Directors was held at the New York Academy of Medicine, on June the 2d and 3d, 1904, Dr. John W. Fisher, Vice-President, in the chair.

The following members were present at some time during the meeting: Drs. John W. Brannan, William R. Bross, Frank W. Chapin, Thomas C. Craig, Henry Colt, G. Pierrepont Davis, Charles A. Devendorf, Edmund W. Dwight, Z. Taylor Emery, John W. Fisher, E. L. Fisk, P. Maxwell Foshay, Frank S. Grant, F. L. M. Grassett, Edward H. Hamill, A. S. Knight, William W. Knight, Joseph Kucher, Edward W. Lambert, R. L. Lounsberry, Elias J. Marsh, William D. Morgan, John P. Munn, Edwin M. Northcott, H. A. Pardee, Arthur Pell, W. E. Porter, Oscar H. Rogers, Edward K. Root, Elmer A. Scott, George R. Shepherd, Brandreth Symonds, H. C. Tabb, James D. Thorburn, S. Oakley Van Der Poel,

John Warren, William P. Watson, Joseph H. Webb, George Wilkins, Thomas H. Willard, Charles H. Willets, Algernon Woolverton, Albert Wood. Total, 42.

1.—On roll call, 13 members, a quorum, were present.

2.—The following were unanimously elected to regular membership:

Charles H. Willets, M.D., Provident Life and Trust Co.

Henry H. Schroeder, M.D., The Mutual Life Ins. Co. of New York.

James D. Thorburn, M.D., North American Life Ins. Co.

P. Maxwell Foshay, M.D., The Mutual Life Ins. Co. of N. Y.

The following were unanimously elected to honorary membership:

Dr. Edward Curtis, Dr. Granville M. White, Dr. Frank S. Grant.

3.—The minutes of the last meeting and of the intervening meetings of the Executive Committee were read. Drs. Tabb and Symonds made a personal explanation of the manner in which the place of the annual meeting was changed from Richmond to New York. The minutes were then adopted as read.

4.—Nomination of officers was in order. Dr. Symonds stated that owing to great stress of work he would have to decline to stand for re-election as Secretary. There was some discussion in regard to this, and finally it was moved by Dr. Northcott that a paid assistant to the Secretary be appointed

by the Executive Committee who shall perform clerical work under the direction of the Secretary. Carried. Dr. Symonds then withdrew his objection to further service.

5. The Committee on Collective Investigation, Dr. Fisher, Chairman, reported that practically nothing had been done since the last meeting. Moved by Dr. Emery that the committee be discharged with thanks until such time as it is ready to make a final report. Carried.

6. The Committee on Collective Selection of Examiners made no report, owing to the absence of the Chairman, Dr. Brannan.

7. The Committee on College Instruction made no report, owing to the absence of the chairman, Dr. Wells.

8. The following amendment to Article VIII. of the Constitution, proposed by Dr. Wells at the Fourteenth Annual Meeting, was unanimously adopted:

"The terms of office of the President and Vice-President, as such, shall be limited to two consecutive years, and they shall be ineligible for re-election until five years have elapsed from the date of their last incumbency of the office."

9. The following amendment to Article III. of the Constitution, proposed by Dr. King at the Fourteenth Annual Meeting, was, on the motion of Dr. Bross, laid on the table until the next annual meeting:

"One new member shall be elected to the Executive Committee each year, the senior member of said Committee dropping out."

10. Dr. Wood opened the discussion on Hepatic Colic. He stated that owing to severe illness he had been unable to prepare such a paper as he desired, and his remarks must not be considered as complying with the request made by the Association at its last annual meeting. The discussion was continued by Drs. Marsh and Shepherd.

11. Dr. Marsh opened the discussion on Syphilis, and presented the following paper:

SYPHILIS AND LIFE INSURANCE.

At the suggestion of the President of this Association I have undertaken to prepare a short paper on Syphilis as Affecting the Acceptance of Applicants for Life Insurance. I have been willing to do so, partly because the subject has never been discussed by this Association, and partly because within recent years there have been some developments and changes of opinion as to the permanent influence of syphilis on the system, and moreover because very considerable thought and labor have recently been bestowed upon the subject by medical and other officers of life insurance companies.

I shall not attempt to give any description of the manifestations and history of syphilis, in either its mild or severe forms, but will pass at once to more important considerations.

First: The demonstration by Fournier, and the subsequent verification by others, of that part of the natural history of the disease which shows the early development of the so-called tertiary lesions. It had been a generally accepted doctrine that the tertiary lesions came on, as a rule, many years after the original infection, and after a considerable period of latency subsequent to the secondary eruptions. It was known that occasionally severe lesions came on earlier in the disease, even in the first year; but these cases were considered as exceptional and precocious. Fournier's observations and carefully prepared statistics demonstrated that earlier tertiary mani-

festations were far from exceptional; that they rapidly increased after the first year, and that within the first five or six years the proportion reached fifty per cent. of the total. His exact figures were as follows:

	CASES
During the 1st year.....	106
During the 2d year.....	227
During the 3d year.....	256
During the 4th year.....	229
During the 5th year.....	205
During the 6th year.....	201
<hr/>	
Total within 6 years.....	1,224
From 6th to 10th year.....	499
From 10th to 20th year.....	543
Above 20 years.....	129
<hr/>	
	2,395

The estimates made by different observers as to the proportion of cases in which any tertiary lesions occur have varied from five to twenty per cent., but it is now generally agreed that the percentage is from ten to fifteen.

If therefore only ten to fifteen per cent. of all cases of syphilis develop tertiary lesions; if in half of these they have manifested themselves before six years after infection; and if only a small minority of tertiary lesions invade vital organs; the actual danger to life from *syphilis directly*, after six to ten years, must be very small.

Second: About twenty-five years ago the clinical observations and investigations of Erb showed that in a very large percentage of the cases of tabes syphilis was found to be an antecedent. In fact, the percentage of cases in which it was found was so large that it was proved to be a predisposing, if not an essential, cause. The same condition was also found in general paralysis of the insane. Careful attention being paid to this by clinical physicians in various parts of the world, Erb's statements were verified, and although the proportion giving a history of syphilis varied in reports from twenty to ninety per cent., still the connection between syphilis and these

two diseases has been thoroughly established, and in a general way it has been demonstrated that tabes and general paralysis are preceded by syphilis in almost seventy-five per cent. of all cases.

Third: A continuance of the investigations on the same line has shown a preceding history of syphilis so frequently in many other cases of disease of the brain and of the spinal cord, in aneurism, and certain diseases of the heart and arteries, that some connection between them is now almost universally acknowledged. The exact nature of this connection or relationship has not yet been definitely determined, but recent pathological investigations seem to point to a general invasion of the arterial system early in the course of syphilis, which may interfere with or modify the permanent nutrition of all or any of the tissues.

T. W. Mott writes:

"The discovery of the pathology and symptomology of syphilitic arteritis has been one of the most important advances in modern medicine. . . . Brain syphilis is an affection of the arteries in one form or another."

Mr. Jonathan Hutchinson writes as follows:

"It appears probable that in many, if not in most, cases of syphilis, the whole arterial system suffers more or less during the earlier stages, and that certain changes take place in the arterial coats, from which recovery may never be absolutely complete. The arteries remain through life liable to take on other forms of disease."

Fourth: As the result of the investigations mentioned, in 1894 Fournier applied the name of "Parasyphilis" to the above and other affections, and published his well-known work on this subject. He here described the diseases as "syphilitic in their origin, but not in their nature," and says there was nothing specific in the lesions, nor in their response to medical treatment.

Gowers had previously written:

"Certain degenerative diseases are very commonly preceded by syphilis, but these degenerative diseases are certainly not syphilitic in their nature. They differ in no respect from

similar morbid processes that occur in individuals who have not had syphilis."

Fifth: In addition to this work of persons devoted to clinical medicine and pathology, within the last ten years there have been a number of discussions and expressions of opinion in various societies of life insurance examiners. I will enumerate:

The paper by Dr. T. C. Fox, and a prolonged discussion before the Association of Life Insurance Medical Examiners, in London; the papers and discussions on the same subject before the first and the second International Congress of Life Insurance Physicians, in 1899 and 1902; the article read by Prof. Runeberg, of the Kaleva Insurance Company, before the Life Insurance Examiners of Northern Europe, in 1900; and in 1903 a paper published in the *Edinburgh Monthly* by Dr. Bramwell; and also in 1903 an article by Dr. Blaschko, of Berlin, read before the first meeting of the Life Insurance Examiners of Germany. There have been also several articles of minor importance published in the medical magazines. In all these papers and discussions there have been, naturally, a variety of opinion and expression regarding the prognosis and importance of syphilis. The chief bearing of these investigations has been on the influence of syphilis as a cause of serious disease and resulting abbreviation of life. The paper of Prof. Runeberg dealt chiefly with the statistics of his own company, the Kaleva. Taking up the entire number of deaths that had occurred in a series of recent years, he drew a conclusion that fifteen per cent. of the deaths were brought about *more or less* by syphilitic infection, and that as a cause of mortality syphilis ranked next to tuberculosis,—the deaths by tuberculosis being twenty-seven per cent. of the whole, while pneumonia, with only ten per cent., fell below syphilis. In obtaining these percentages he took first all the cases which acknowledged a history of syphilis at the time of insurance, and secondly those which in their termination gave evidence of a probability of syphilis, according to the data given above; namely, that the cause of death was one of those forms of disease that have been so frequently associated with syphilis. In addition to this, he

accepts also the inferences made above,—that when death occurs under fifty years of age from cerebral hemorrhage or softening, in seventy-five per cent. it is of syphilitic origin; and that in deaths from sudden heart affections at the same age period—as angina, and aneurism—syphilis has been the cause of fifty per cent. By taking the proper number of deaths at these ages and by these causes, he has raised the proportion of deaths due to syphilis to fifteen per cent. in all cases. This article of Prof. Runeberg was critically analyzed by Dr. F. Parkes Weber in the London *Lancet*, who concludes as follows:

“I believe that Runeberg can hardly have over-estimated the influence played by syphilis, if he meant, syphilis played *some part* in inducing fifteen per cent. of the total number of deaths.”

Runeberg's figures were again discussed by Prof. Salomonsen, of Copenhagen, at the second International Congress, with some statistics of his own company. He was not prepared to agree with Runeberg's conclusions, and stated that there was not sufficient evidence for believing that apoplexy, softening of the brain and heart disease were caused under the influence of syphilis to any such extent as Runeberg had supposed, and he therefore controverted the claim that it had any large influence in causing premature and excessive mortality. In 1903 a paper was read by Dr. Byron Bramwell and published in abstract in the *Edinburgh Monthly*. In this he quoted freely from Runeberg's statistics and opinions, and presented an analysis of the experience of the Scottish Widow's Fund Company. His line of argument is very much the same as Runeberg's, whom he thoroughly corroborates in all his statistics, both as to the influence of syphilis as a cause of chronic lesions of the circulatory and nervous apparatus, and in its influence in shortening life.

Dr. Blaschko's paper takes up elaborately the whole subject of syphilis, both as to its prevalence and its influence on life, quoting freely from the above-mentioned authors, and in a general way corroborates and coincides with their views and statements.

Before passing to the next branch of the subject, I would remind you of the danger of having one's judgment misled by fixing the thoughts too intently on a one-sided range of experience. We must not allow the perspective of the landscape to be overlooked, by the observance of some imposing object in the foreground. The serious and striking cases of syphilis loom up before our minds and tend to make us forget the other side. Those of us who are engaged in general or hospital practice know that the actual cases of general paralysis, tabes and aneurism are rare at all times, and excite our interest not only on account of their seriousness, but of their rarity as well. Gowers says: "Tabes is probably a rare sequel when regarded from the side of syphilis." Not only tabes, but these other affections assumed as caused by syphilitic influence are comparatively rare on the mortality records of our hospitals and our life insurance companies. The large majority, probably two-thirds at least of all syphilitic cases, never present any serious lesions, nor does the physician have anxiety as to the final issue. I will give quotations from a recent text-book, which will present this side of the question far more clearly than I can do.

"Practically, in the majority of instances, syphilis is a mild disease. It gets well, to all intents, under a variety of treatment, or under no treatment at all very often. . . . Allowing that bad cases may continue to relapse almost indefinitely, and that some late lesion due to syphilis may occasionally appear after any treatment, upon a patient once affected, even possibly up to the hour of his death, yet the common duration of the disease is only about two and a half to three years, and many cases do not have any symptoms longer than a few months."

Again:

"In a majority of cases, however, in reasonably healthy persons, the type of the disease as encountered at the present day is mild. It can be controlled to a great extent by treatment. Thousands of individuals pass through unharmed in tissue, in feature, in function, to reach a green old age and die of natural causes, leaving behind them healthy offspring."

In many of these papers and discussions there had been expressed both a regret and a hope as to the action of life insurance companies with regard to their availing themselves of their own proper experience:—a regret that there had been no actual investigation as to the comparative mortality of their syphilitic risks, and a hope that such investigation might be instituted. A complete investigation is scarcely possible: the only possibility would be an investigation of those risks acknowledging a history of syphilis at the time of insurance, for many applicants neglect to mention it, and others acquire the disease after acceptance. However, such an investigation has finally been attempted, and accomplished, in the recently published report of the Actuarial Society of America, giving the experience of thirty-four American companies. This report embraced the experience of the companies in certain special classes of risks; and one of the classes was "syphilis." The records of all male lives insured between 1869 and 1900 in the United States and Canada were inspected, and those who were supposed to have given a history of syphilis were duly marked. This selection of syphilitic cases, however, was not strictly accurate, as partly on account of the indefinite form of question in some of the applications, and partly on account of the manner in which the recorded facts were interpreted and copied, a discrimination between the local (chancroid) and the constitutional disease could not be made, and very frequently the meagre statement of some lesion or symptom occurring many years previously is insufficient for any medical judgment. This possible form of fallacy must be kept in mind, although on the whole it may be assumed that the large majority were truly syphilitic. The total number of lives collected in this investigation as syphilitic was fifty-three hundred and eighty-five (5385), and the number of deaths was three hundred and ninety-seven (397).

The elaborate tables in the actuaries' report show the experience for each year of life and each year of insurance. The final summary is as follows:

Expected deaths.....	298
Actual deaths.....	397

This result is certainly surprising, and although in general accordance with medical opinion, shows a more excessive mortality than would have been anticipated from any supposed influence of syphilis alone.

A further subdivision of the above experience according to the age and insurance duration shows this increased mortality to prevail throughout. While the insurance duration is of no direct significance, it is important as indicating the continuance of the syphilitic influence long after infection.

With the hope of throwing some light or explanation on these figures, I have endeavored further to investigate cases which were contributed by the Mutual Life to the above actuarial tables. It is proper to state, however, that the number of cases and the experience in the Mutual Life has been very small, as for very many years there was a strong opinion adverse to the acceptance of any persons who were known or suspected to have had constitutional syphilis. Only in exceptional instances were applicants with a record of constitutional syphilis, chancre or chancroid accepted as risks. After the year 1895, however, the action of the company was broadened and these exceptions became more numerous

The total number of cases collected for the actuary's report was only three hundred and twenty (320) lives, and thirty (30) deaths. In order to increase the number and get the benefit of still further experience, I have continued the record of acceptances for another year, and followed up the life histories of the insured for three years. Adding these cases, and omitting a few which were found to have been compiled through error, I have collected a total number of four hundred and eighty-eight (488) cases, with thirty-nine (39) deaths. The figures are too small to be of much value in estimating the comparative mortality, but an analysis of the fatal cases may show where there is any justifiable suspicion of the influence of syphilis in shortening life. The following table gives the cause of death the age at death and the

period between infection and death of each of the fatal cases:

DEATHS IN PERSONS GIVING A HISTORY OF ACTUAL OR PROBABLE
SYPHILIS AT ACCEPTANCE.

No.	Causes of Death	Age at Death	Duration of Insurance	Period from Initial Lesion to Death
A	Acute diseases having no relation to syphilis	Years	Years and months	Years
1	Fevers—typhoid, etc.	27	2	4
2	"	48	3-4 mos.	14-15
3	"	52	3	20
4	"	51	4-6	34
5	Pneumonia	28	2-11	4
6	"	25	-8	3
7	"	44	5-11	15
8	"	49	13-2	27
9	Influenza or Grippe	24	-5	1
10	"	44	-5	1
11	Appendicitis	48	2	22
12	Casualty	43	-6	7
B	Chronic diseases—no presumption of syphilis	Years	Years and months	Years
13	Consumption and chronic lung disease	36	4-10	12
14	Consumption	35	6-1	14
15	"	53	6-5	26
16	"	55	23-7	31
17	Cancer of stomach	47	14-9	23
18	Morphinism	61	8-7	41
19	Sudden death (disease of prostate)	68	11-8	42
20	Cerebral embolism	84	22-7	58
21	Cirrhosis of liver (alcohol)	52	15-7	28
22	Ulceration of bowels—chronic	56	20-4	?

**DEATHS OF PERSONS GIVING A HISTORY OF ACTUAL OR PROBABLE
SYPHILIS AT ACCEPTANCE.**

No.	Causes of Death	Age at Death	Duration of Insurance	Period from Initial Lesion to Death
C	Presumption of syphilitic influence	Years	Years and months	Years
23	Syphilitic disease of larynx	37	1-9	14
24	Cerebral syphilis	31	-10	9
25	Heart disease—syphilitic	31	1-4	6-7
26	Insanity and Epilepsy	43	7-1	20
27	Apoplexy	33	2-3	14
28	Apoplexy—alcohol	40	3-7	18
29	Cerebral embolism	46	16	26
30	Cerebral softening	46	1-9	12-20
31	Paralysis	41	3-10	?
32	Heart disease—sudden death	51	10-5	?
33	" " " "	47	6-7	24
34	" " " "	44	1-5	9-10
35	" " " "	44	2-6	22
36	" " (probably an- gina pectoris)	53	1-	10
37	Aortic aneurism	49	9-6	24
38	Diabetes, etc.	35	9-3	11
39	Pernicious anæmia, etc.	43	20-3	26

Case 23.—Treated by Fournier originally; thorough treatment for one year, at least. There was no recurrence of disease until a few months before death.

Case 25.—Thorough treatment; no evidence of disease for many years. The attending physician says syphilis may have been the cause of heart disease.

Case 26.—In the year following insurance he was stated to have had an injury of the head (exact nature of injury not stated), followed by traumatic epilepsy for two or three years; then became insane; was sent to a lunatic asylum where he died, after five or six years, of typhoid fever.

Case 31.—Had been a steady drinker; health failing sixteen months; gradual loss of power, with occasional symptoms of paralytic strokes; finally fatal stroke.

Case 32.—Mitral insufficiency; no illness.

Case 33.—Used alcohol freely; some weeks before death had been drinking heavily, and went to Hot Springs, Arkansas, where he died.

Case 34.—On post-mortem, thin heart walls; mental strain reported.

Case 39.—Duration of original disease two and a half years, with secondaries. Before death had sclerosis of the spinal cord.

This method of analysis of deaths, used by Runeberg and Bramwell, has been criticised as being of little value, in that there is no table of comparison to go by, to show whether the diseases presumed to be of syphilitic origin have appeared in greater or smaller numbers than they appeared in the community at large, or in any equal number of individuals in whom there is no suspicion or presumption of syphilis. While this criticism is perfectly just, it does not entirely do away with the value of the statistics, and it appears to me to be the only method in which they can be used, and another table, introduced later, may be a fair standard of comparison.

As this analysis relates chiefly to the causes of death, the list is divided into three classes, as they may or may not in any degree give rise to suspicion of syphilitic influence. The first class gives twelve (12) deaths from acute diseases which have no relation to syphilis, as typhoid fever, pneumonia, appendicitis, casualty. The second class gives ten (10) deaths from chronic diseases in which the influence of syphilis is possible, though improbable, as consumption, cancer, etc. There is one case of cerebral embolism, but the age (eighty-four) places it properly in this class. The third class gives seventeen (17) cases in which there is either proof or presumption of syphilitic influence. In three of these cases the death was imputed directly to syphilis,—cerebral syphilis, syphilitic heart-disease, and syphilitic disease of the larynx. All of these three cases were between thirty and forty years of age. Six cases died with symptoms of brain disease, and all of these died at forty-six or under. Six died from heart

disease,—two at ages over fifty, and four between forty and fifty. One died of diabetes and one of pernicious anæmia.

I would call particular attention to the last case, which may be thought to be improperly included in the class. The history was that of contraction of the disease in boyhood, with a history of both primary and secondary manifestations. Several different policies had been taken out in the company, so that the entire duration of insurance was twenty (20) years. The final illness was under the observation of an accomplished physician, in which the death was ascribed to pernicious anæmia, with a further statement that during the latter part of the illness there were symptoms of sclerosis of the spinal cord. The death proofs give no indication of the early history, nor is there any reason to believe that the physician had cognizance of it.

The third column of these tables is interesting as showing the long period of time that elapsed in the majority of cases between the contraction of syphilis and death. Of the seventeen deaths, in two cases the exact date of the contraction is not given. Of the remaining fifteen, in only two was it within ten years of the contraction, and in eight cases it was more than fifteen years. The importance of this point consists in establishing the fact as to the long-abiding influence of the disease.

Prof. Salomonsen, in criticising Runeberg's paper, argued that apoplexy and other diseases of the nervous and circulatory systems were not at all uncommon before the age of fifty years, and that it was not fair to assume a history of syphilis in from fifty to seventy-five per cent. of such cases. It is undoubtedly true that other influences besides syphilis tend to produce similar degenerative diseases of the blood-vessels, such, for instance, as gout, alcohol, and Bright's disease, and the question is as to the relative amount of influence of each. To ascertain whether the influence of syphilis was overrated, and to form a standard table, I have taken the number of deaths in persons under fifty years of age caused by diseases of the nervous and circulatory systems,

and have used this as a standard of comparison with those giving the syphilitic history as above:

Males under fifty years of age.	Mutual Life, 1902 and 1903	Syphilitic History.
Deaths from all causes.....	3,719	28
Diseases of nervous system.....	423	6
Diseases of circulatory system.....	120	4
	543	10
Per cent. of total.....	14.6	35.7

It thus appears that in the general mortality the deaths from this class of diseases were only fourteen and one-half per cent., while among syphilitics they were thirty-five and one-half per cent., or more than two and a half times as many.

This entire subject, however, in my opinion, deserves further investigation and study by life insurance companies, and I hope that some of the members of this Association may continue it, either in a manner similar to my own or otherwise, as may seem to them to promise the best results. The actuaries have demonstrated that, as a matter of fact, the mortality has been excessive among a number of lives that were placed in a class solely on account of a past history of syphilis; it is incumbent on us, as medical directors, to study from a medical point the reasons for this high mortality,—whether it is rightly attributable to syphilis or whether there are other influential, though hidden, factors. We were probably all prepared for the demonstration of some unfavorable influence, but scarcely to the extent now shown. For myself, I cannot say that I feel satisfied that syphilis is the sufficient cause for this unfavorable result, and yet I can find no other, as far as our records go. I am not satisfied,—partly because in so many cases the death followed such a long time after infection, and partly because in so large a proportion of the cases on which the actuary's report is based there was no history of constitutional syphilis, but only of local venereal disease.

We must not, however, expect too much from our statistical investigations; these studies of ours cannot advance our

knowledge of syphilis, and for such knowledge we must be dependent on the clinical observers and pathologists; we can only verify their investigations and determine the severity and amount of the possible influence.

Passing from this discussion, we will take up the final and practical questions for life insurance medical directors.

First: How far does syphilis shorten life? and,

Second: How should applicants with a history of syphilis be treated by life insurance companies?

In all the discussions already quoted I find that while on certain essentials there is a general agreement of opinion, on the other hand there is a considerable range on minor points; and it is especially to be noted that Runeberg, Bramwell, and others who have been most strenuous in establishing the influence of syphilis in causing other diseases, are lenient in the imposition of extra charges for insurance. Bramwell has attempted to estimate the probable shortening of life among all syphilitics, and finds only from two to three years as an average. Blaschko says that this is too small, and makes it about four or five years, and they each advise an advance of premium to this extent. However, both these estimates are crude, and established on a very insufficient basis. The general judgment seems to be as follows:

First: That while syphilis should always be considered a blemish, it should not, as a general rule, exclude applicants from acceptance; that with rare exceptions a certain extra charge should be made, depending upon the conditions of each case.

Second: That no applicant should be accepted who at the time of his examination shows any manifestations of syphilis; and as a further extension of this idea nearly all advise that the person shall have remained entirely free from any manifestation for a period of from six months to a year.

Third: That no applicant shall be accepted until a definite period shall have elapsed from the time of infection. There is some difference as to the extent of this period. A few have placed it as low as two years: the general opinion seems to be in favor of four or five years. In my advice to my own

company, given several years ago, I fixed the period at six years; this period was based largely on the same general grounds as others have taken, but chiefly because, as shown by the statistics of Fournier, one-half of the danger of the manifestations of tertiary lesions would have passed by that time.

Fourth: Most advise that no applicant who gives a history of any tertiary lesions whatever should be accepted: a few are willing to accept, with a heavy extra charge.

Fifth: It is deemed essential by many, and by all extremely desirable, that there should be a history of thorough, methodical, and continuous treatment, extending over two or three years. While the advantages of treatment are undoubted, and especially insisted upon by those most experienced in the treatment of the disease, I have failed to find any satisfactory evidence to prove that it has great influence in preventing the development of graver lesions of the nervous and circulatory systems. The wonderful power of mercury and the iodides in arresting and curing the manifestations is so thoroughly established that it seems to be assumed that they may be equally valuable and effective in making a permanent cure. But the two conditions are by no means the same; in fact, as before stated, it is not improbable that the injurious influence and effect of syphilis in causing arteritis is exerted in the very early stages of the febrile condition and the cutaneous eruptions, and this effect remains through life, causing degenerations of the arterial tissues which are no more to be effaced by remedies than the scars resulting after deep ulcerations. Furthermore, it is often assumed, from some expressions of opinion, that in case any new manifestations should appear, the persons who have been once thoroughly treated will again place themselves at once under competent treatment; but this assumption cannot be depended upon. Too frequently, in the vicissitudes of life, and the habits of change of home and business, it is impossible to suppose that these persons could be constantly in a position where in case of illness they can be advised by the physicians who are cognizant of their past history, or that

their subsequent treatment will be at all of the same grade as in the first attack.

Sixth: As stated above, syphilis should be considered a blemish; and while most cases are insurable, if in addition to the syphilis there are other unfavorable circumstances super-added, as, for instance, unfavorable hygienic conditions, any tendency to tuberculosis, any suspicion of intemperate habits, they should not be accepted, even after all signs of disease have disappeared.

Seventh: Assuming that most syphilitics are insurable at some rate and on some form of policy, the extra charge will necessarily vary with the method of each company and with the experience and temperament of the medical adviser. The discussions in the various medical societies indicate a leniency of judgment and an inclination to advise a comparatively slight increase of premium for the most favorable cases. The method may be either by a direct extra charge, by rating at a higher age, or by limiting to a special form of policy. It is the practice of the Mutual to accept syphilitics only after an interval of six years from infection, upon an assurance of a satisfactory course of treatment, and where there have been no tertiary manifestations; and then to grant only endowment insurance. The recent studies and reports of Runeberg, Bramwell, and the Actuarial Society raise a grave doubt as to the wisdom of this present practice, and seem to call for a review of the subject, and at least that our judgment must be held in suspense until this extremely unfavorable report of the Actuarial Society can be further studied, and possibly explained by factors and conditions that are not now evident. As the experience now stands, the extra rating should certainly be considerable, if such risks are to be accepted at all.

The discussion of this paper was continued by Drs. Bross and Emery. Moved by Dr. Symonds that the President appoint a committee of three to investigate the matter of syphilis and other subjects

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in accordance with the suggestions contained in Dr. Marsh's paper and with the hearty co-operation of the allied companies. Carried.

12. Moved by Dr. Northcott that the meeting adjourn until the following day at 10 A.M. Carried.

SECOND DAY.

The meeting was called to order at 10 A.M., President Hamill in the Chair.

1. Roll-call showed the presence of a quorum.
2. The following officers were elected for the ensuing year:

PRESIDENT.
JOHN W. FISHER.

1ST VICE-PRESIDENT.
OSCAR H. ROGERS.

2D VICE-PRESIDENT.
THOMAS H. WILLARD.

SECRETARY.
BRANDRETH SYMONDS.

TREASURER.
AUG. S. KNIGHT.

EXECUTIVE COMMITTEE.
ELIAS J. MARSH,
WILLIAM R. BROSS,
GEORGE R. SHEPHERD.

3. Mr. F. H. Johnson, Assistant Actuary of the Prudential Insurance Company, then addressed the Association on the report of the Actuarial Society. His remarks were interesting and were discussed by Drs. Hamill, Rogers, Marsh, and Fisher.

4. Mr. John B. Lunger, Vice-President of the Traveler's Insurance Company, addressed the Association on "The Measurement of Risks and Substandard Insurance." This was an address of absorbing interest, and the members followed it with close attention.

5. Dr. Wood moved that the Secretary be instructed to send to each company the Transactions of the Association. Carried.

6. Dr. Tabb moved that the Secretary be instructed to send to Mr. Lunger a letter of thanks for his address. Carried.

7. The President then opened the discussion on Renal Colic. Further discussion by Drs. Dwight and Wood followed.

8. Dr. Lounsberry moved that the meeting adjourn *sine die*. Carried.

In the evening the Annual Dinner was held in the roof garden at Delmonico's. The following members were present: Drs. John W. Brannan, Henry Colt, G. Pierrepont Davis, John W. Fisher, E. L. Fisk, F. L. M. Grassett, Edward H. Hamill, William W. Knight, Elias J. Marsh, William D. Morgan, John P. Munn, Edward M. Northcott, H. A. Pardee, W. E. Porter, Edward K. Root, George R. Shepherd, Brandreth Symonds, H. Cabell Tabb, S. O. Van Der Poel, William P. Watson, George Wilkins, Albert Wood, Alg. Woolverton, A. S.

Knight, T. H. Willard, J. D. Thorburn, E. W. Dwight.

Dr. Hamill acted as toastmaster and was most felicitous in his remarks. Everybody was called upon to speak at least once. Dr. Brannan spoke feelingly of the late Dr. Winston as one thoroughly qualified to pick out a menu and arrange a dinner, but he said that he had a worthy successor in the present dinner committee, Dr. Porter, to whom he moved a vote of thanks, which was unanimously adopted.

SIXTEENTH ANNUAL MEETING.

The Sixteenth Annual meeting of the Association of Life Insurance Medical Directors of America was held in New York City at the Academy of Medicine on October 25 and 26, 1905—President Fisher in the chair.

The following members were present at some time during the sessions:

W. R. Bross, Frank W. Chapin, T. C. Craig, Edward Curtis, John L. Davis, C. A. Devendorf, E. W. Dwight, Z. T. Emery, J. W. Fisher, E. L. Fisk, F. S. Grant, J. B. Hall, E. H. Hamill, E. M. Holden, P. H. Ingalls, A. S. Knight, W. W. Knight, Joseph Kucher, J. B. Lewis, R. L. Lounsberry, E. J. Marsh, W. D. Morgan, J. P. Munn, Wm. Natress, E. M. Northcott, H. A. Pardee, Arthur Pell, W. E. Porter, T. H. Rockwell, O. H. Rogers, E. K. Root, H. C. Scadding, H. H. Schroeder, E. A. Scott, G. S. Stebbins, Brandreth Symonds, H. Cabell Tabb, J. D. Thorburn, Harry Toulmin, S. O. Van der Poel, G. A. Van Wagenen, John Warren, Frank Wells, T. H. Willard, C. H. Willetts, Algernon Woolverton, Albert Wood, J. C. Young. Total, 47.

The roll-call showed twenty-six members present, a quorum.

The following candidates were unanimously elected to membership:

Dr. W. H. King, Fidelity Mutual.

Dr. W. R. Cluness, Jr., Pacific Mutual.

Dr. T. H. Rockwell, Equitable Life.

Dr. F. C. Wells, Equitable Life.

Dr. Henry A. Baker, Washington Life.

Dr. Wyeth E. Ray, Travelers.

The following candidate was unanimously elected to honorary membership:

Dr. J. W. Brannan.

The minutes of the previous meeting and of the intervening meetings of the Executive Committee were read and approved as read.

The President then delivered his annual address, mainly on practical points in the management of the medical affairs of a life insurance company.

The Committee on College Instruction in making Life Insurance Examinations, Dr. Wells, Chairman, reported no progress and asked to be discharged. Moved by Dr. Emery and carried that the Committee be continued with thanks. Moved and carried that this motion be reconsidered. Moved by Dr. Emery that the motion be amended so as to read that the Committee be discharged with thanks. Carried.

The Committee on collecting information regarding syphilis and other subjects, Dr. Marsh, Chairman, reported progress and asked to be continued. So moved and carried.

At the evening session the following paper was read by Dr. Arthur Pell:

HEART MURMURS FROM AN INSURANCE STANDPOINT.

It is unnecessary in this paper to touch upon the anatomy or physiology of the normal heart, or to refer to the pathological conditions found on post-mortem in diseases of this organ, as these are questions with which we are all familiar. The subject will be treated solely from the standpoint of a life insurance officer, giving attention as much as possible to its practical side and confining the paper within as narrow bounds as may be to the consideration of the particular

cases of heart trouble evidencing itself by the presence of murmurs. It is necessary in cases showing these defects to obtain as clear and distinct an idea as possible of the exact conditions existing; and the fitness of the examiners to do their work assumes great importance to the companies handling this class of risks. They should be instructed to give a succinct account of the rational as well as the physical signs which present themselves at examination or have been in evidence prior to that time.

We have all noticed that many of our examiners, despite the great care taken in their training at the medical colleges, pay very little attention to the character of the heart murmur they discover, satisfied as a rule with the fact that a departure from the normal exists. They do not give us a definite idea of the valve involved, or inform us whether the murmur is heard in systole or diastole. This fault probably arises from the fact that in the past it was the custom of most of the insurance companies to decline outright all risks criticised along these lines. In the past the average examiner paid very little attention to the description of the condition of the muscular tissue composing the heart, or to recording the general condition of the vascular-system. The old saw to the effect that a man is as old as his arteries is constantly turning up trumps in the insurance field, and it is our duty to call this fact to the attention of the examiners. In considering this subject we must remember that our applicants are not usually examined by great heart specialists, who are able to differentiate the character of the cases brought before them far better than the average man, but come before examiners scattered throughout the country, some of whom are men of great attainment and knowledge, and others meagerly equipped for the work which they undertake. I wish to emphasize the fact that there is one phase of this matter which is usually neglected, and which is of great importance to companies assuring under-average lives, that is: the training of the examiner in the requirements of this new style of business. It is necessary that the Directors should be given a clear, definite and distinct idea of the exact valve

involved when there is a murmur, the time when the murmur occurs, the condition of the heart action both after rest and exercise and a definite description of any symptoms which may be present, referable to vascular disorder, such as dyspnoea, palpitation, disturbance of the digestive organs, etc. Signs of degeneration along the tract of the vessels, such as tortuous temporals and thickened arteries, should be carefully noted. It is impossible for the examiner to gauge the exact condition existing from the intensity of the murmur; a serious condition may exist when a very slight murmur is heard, on the contrary a loud murmur may be indicative of only a slight degree of disturbance. The main thing to be inquired into is the condition in which this defect has left the muscular fibres of the heart, and the effect it has had upon the arterial system. It is necessary for every examiner to have a thorough knowledge of the boundaries and action of the normal heart, and the points at which it is necessary to listen to ascertain whether a murmur be present. This knowledge is easily obtainable, but unfortunately is often neglected. Every examiner should have a clear conception of the various heart areas; the aortic area lying on the right side of the sternum between the second and third rib, the pulmonary area lying at the left side of the sternum between the third and fourth ribs, the mitral area lying about half way between the nipple line and left border of the sternum in the fifth interspace, the tricuspid area lying a few inches above the point of the sternum in the median line, and the area over the angle of the left scapula behind. He should grasp the fact that as a rule a murmur in the aortic area with the first sound of the heart is an aortic direct murmur, indicative of stenosis of the aortic valve; that a murmur heard with the second sound of the heart over the aortic area is the so-called aortic indirect or regurgitant murmur; that a murmur heard with the first sound of the heart over the mitral valve indicates the so-called mitral regurgitant or indirect murmur—this murmur is often transmitted to the angle of the left scapula; that a murmur with the second sound of the heart over this area is a mitral direct murmur,

and indicates stenosis of the valve; that at times this murmur either runs through diastole, or is heard just before systole—the so-called presystolic murmur. The murmur most frequently heard at the pulmonary area occurs with the first sound of the heart. Murmurs heard over the tricuspid area are usually brought about by the effort to relieve tension in the right ventricle and are the result of disease of other valves. It is often almost impossible to be thoroughly satisfied with the nature of the heart murmur, whether it be merely functional in character, or the result of organic disease. Where the diseased condition is indicated in the vascular system, the heart itself or in the peripheral organs, it is not difficult to diagnosticate between the functional murmur and the organic murmur; but where these conditions are absent, and there is no history of recent illness and no anæmia present, it is very frequently impossible to determine the character of the murmur, and the benefit of the doubt should be given to the company. The so-called cardio-respiratory murmur is easy of detection, when any degree of care is observed in the examination. A large percentage of these functional murmurs occur in systole, and have their maximum intensity over the pulmonary or aortic area.

Heart murmurs differ much in character, and the prognosis in different forms of disease evidencing itself by this symptom is so diverse that we are obliged to consider each case on its merits. The valve involved, the occurrence of the murmur in diastole or in systole, the condition of the heart muscle, the frequency of the pulse and the condition of the vessels are of vital importance to the medical referee. The mitral valve is the one oftenest involved; the murmur most frequently noted at this valve is the so-called mitral regurgitant murmur; next in frequency is the aortic regurgitant murmur, next the mitral direct and finally the aortic direct. Tricuspid murmurs as a rule are the result of advanced disease, and may be left out of the question. The pulmonary murmurs most frequently heard are of inferior importance, but it must be taken into consideration that at times aortic murmurs are most clearly heard over the pulmonary area.

The causes producing these various murmurs need not be referred to in these papers. Although evidences of particular forms of disease giving rise to aortic direct murmurs are very infrequently found on post-mortem, it has been my experience that murmurs are very frequently heard in systole over the aortic area. The results of post-mortems show that most of these murmurs must be functional, and not the result of disease of the valve. Notwithstanding this fact, it is almost impossible in a large percentage of the cases to be positive that an organic murmur does not exist unless there is accompanying anæmia or a history of some recent illness or evidence that the murmur is cardio-respiratory in character. The murmurs caused by anæmia, and the cardio-respiratory murmur, are easily detected, but we are unable to attribute many of the aortic murmurs to either of these causes, and prudence dictates the course which protects the standard policy-holders. The aortic indirect murmur is an indication of a very serious condition, and cases of this kind should be declined outright, or accepted upon an extremely heavy lien. The mitral direct murmur also indicates a condition of great gravity. The mitral regurgitant murmur belongs to a class of cases which are particularly good subjects for sub-standard assurance. A defect of this character in the mitral valve will be taken care of for a long time in the average case, and provided the muscular tissue composing the heart be in good condition the progress of the disease is apt to be very slow. The presence of a moderate amount of hypertrophy is only a safeguard, but if this becomes excessive, or any signs of dilatation are present, acceptance of the risk becomes a mere gamble.

The insurance examiner often has neither the time nor the opportunity given him to observe thoroughly the condition of the heart which he is examining. The action may be perfectly regular, the pulse may be of good quality at the time of the examination, and it may still be practically impossible to ascertain the actual condition, unless many opportunities are given of seeing the risk, and this is out of the question. Even then knowledge of the presence of occasional

palpitation, shortness of breath, etc., can be obtained only by appealing to the applicant. For this reason it is wise to scrutinize carefully every case where a heart murmur is reported, even where it is reported as a functional murmur.

The statement that every life has an insurance value is generally accepted (you will perhaps remember that this fact was dwelt upon by Mr. Lunger at the time he appeared upon our platform last year and delivered his eloquent address); and further, that it is merely a question of obtaining a clear idea of the conditions existing and providing for any extra mortality which arises among any certain classes of risks by corresponding loadings of the premiums. If these statements be true, we will find that cases giving evidence of disturbance of the heart by the presence of murmurs are particularly fitted as a class to be accepted as sub-standard risks with an extra premium or on the lien plan.

The average longevity of large groups of heart cases can be fairly well ascertained, as many of these cases in the past have come under the observation of the directors of our various companies. It is feasible to accept many of these on the loaded premium basis. The part of wisdom in all of these calls for a termination of the contract before late middle age is reached, as the danger from the defective valve increases in proportion with increasing years. I do not mean to assert that no subject having a defective valve will reach supreme old age, as, like every busy practitioner, I have seen many of these cases attain great longevity; but the death rate is so heavy after age fifty-five that it is difficult to impose an adequate loading. Before the introduction of the sub-standard class in life insurance, an endeavor was made to provide for the extra mortality which was known to exist among applicants giving indications of valvular degeneration by placing many of these risks on Endowment policies of various lengths in the standard class. This method of arranging for extra mortality seems to be very faulty, both practically and theoretically. Although it may be conceded that the greatest mortality exists among cases of this character after the age of fifty is reached, still I do not think that any

of us would be bold enough to assert that the class of risks made up of people who have valvular disease would be expected to give a normal rate of mortality at any age. The very fact that great difficulty exists, even after lengthy and careful observation, in gauging the possible results of a diseased valve in the near future, should make us hesitate to accept risks marred by valvular murmurs on any form of standard policy.

As to the use of the Endowment form to carry the extra hazard on these risks, I can only say it seems to me that in issuing Endowment policies we forget that the guarantees in this class of policies are very liberal, and that the premium is fixed on the basis of the normal death rate. Our duty is to give standard policies to standard lives only. It is hardly fair for us to make the standard lives carry the burden which would be imposed upon the class if we accepted in that class risks which are impaired, and an applicant who has an organic murmur is an impaired life, and should be classed as such.

DISCUSSION.

By Dr. Root.—No life should be insured at standard rates which gives evidence of organic valvular disease. Care should be taken however to differentiate cardio-respiratory murmurs, for they are entirely harmless. There is also a murmur due to the pressure of an over-distended stomach. This is systolic, may be heard anywhere in the precordium and disappears when the stomach is emptied. It is of no significance. The sphygmomanometer is of much value in determining the insurability of a risk, for if the blood-pressure is 180 mm., or higher, the risk is doubtful. On the other hand, a low reading is not so significant, either positively or negatively.

By Dr. Porter.—Most examiners find it difficult to differentiate between organic and functional murmurs. The supine posture is of much value for this purpose, especially in the case of cardio-respiratory murmurs.

By Dr. Van der Poel.—For purposes of sub-standard insur-

ance it is very necessary that the medical examiner give an exact anatomical diagnosis of a heart murmur. This can be much facilitated by the use of a diagram, on which the examiner locates the position of the apex, the situation and distribution of the murmur and its time in the heart cycle. Another point of much consequence in these cases is the occupation. Sedentary occupations are more favorable than those involving severe muscular exercise.

By Dr. Morrissey.—The murmur of aortic stenosis is frequent but the lesion on autopsy is rare. This is also the case with mitral regurgitation, though to a less marked degree. After all a most important factor is the condition of the walls of the heart. The examiner should outline a prognosis in every case of heart murmur. Besides the condition of the heart itself, there are four elements in this:

(1) The length of time during which the murmur has lasted. The longer this is the more favorable is the prognosis.

(2) The cause of the endocarditis. If this is rheumatism, it is less favorable.

(3) Occupations, those of a sedentary character being more favorable.

(4) Age.

By Dr. Rogers.—The so-called functional murmurs, especially those at the base, have shown a very high mortality when insured.

By Dr. Toulmin.—The rule of the Penn Mutual is to reject all cases in which the medical examiner reports a heart murmur.

The discussion was then closed by Dr. Pell.

The following paper was then read by Dr. Edmund Welles Dwight:

THE SIGNIFICANCE OF ALBUMIN AND CASTS WHEN
FOUND IN THE URINE OF APPARENTLY
HEALTHY APPLICANTS FOR LIFE
INSURANCE.

The significance of albumin and casts when found in the urine of apparently healthy applicants for life insurance is a subject which, directly or indirectly, has been approached by a very large number of medical men by various routes.

The amount which has been written and is being written on kindred subjects is almost immeasurable, and yet, in their present form, the results are, for our purposes, practically worthless.

Statistics of many kinds, from many sources, are available. Impressions and opinions are variable and without number, but I have yet to find any solid foundation of fact which has been sufficiently cleared of waste and useless material to offer a definite standpoint from which a Medical Department can obtain a clear view of the subject.

I have no reason to believe that, in this paper, I shall be able to settle the question which is implied by its title. I have no idea of even trying to say the final word on any part of the question, as it presents itself.

If I am able to clear away some of the almost impassable obstructions which have accumulated; to sweep aside in any considerable amount the mass of impressions which is now obscuring facts which might serve for a foundation upon which a superstructure worthy of the interests which we represent could be erected, I shall feel that the work has been well done and worth doing.

It is not necessary for me to say anything as to the importance of the subject, or its magnitude, and you will all appreciate the difficulty of treating the general subject in the time at our command.

When this paper was first proposed, it occurred to me that if I could obtain the opinions and methods employed by the various companies, I should find that on many points they were agreed, and that, in so far as they were agreed, it

would be unnecessary for me to discuss or elaborate the question.

I formulated certain questions and sent them to the various members of this Association, with the result that I was so fortunate as to receive prompt and definite replies from thirty-one of the companies represented.

In tabulating these replies, I was surprised to find that on portions of but two points was there any unanimity of opinion; that upon all others the decisions, methods, and opinions were so divergent as to impress me with the fact that the action of most companies was based upon impressions rather than facts.

When decisions are based upon impressions they are dangerous, and when such impressions vary over wide limits but one of them can be accurate, and the chances are against that one being entirely so.

Of the companies reporting, four required microscopical examinations when the amount of the insurance involved was \$10,000; five when it had reached \$15,000; seven at \$20,000; five at \$25,000; two at \$50,000; and six stated that they had no rule for making microscopical examinations.

As to the age after which microscopical examination was required, we find two companies giving 45 years; five, 50; and three, 60.

For making the microscopical examinations, five companies utilized their regular examiners; nine had examinations made at the home office, while six used the services of expert examiners or chemists at the home office.

In the matter of treatment of applicants who either present albumin at the time of examination or give the history of having had it, I find one company stating that they definitely decline them; the same company, however, accepts them as sub-standard risks. One states that they decline under these circumstances all over 40 years, one over 45 years, and one over 50 years. I find twelve companies that have a definite number of months for which they postpone such applicants and twenty-three that state they are accepted after repeated examinations.

On the questions of casts I find that all companies but three either decline them absolutely or treat them, in a general way, as they do albumin. Four companies report that they accept cases showing a few hyaline casts in exceptional instances.

As to the use of outside experts, presumably chemists not attached to the company's office, I find that their regular use is acknowledged by only four companies, while ten state that they use them but rarely.

The two questions upon which there is practical agreement are "Tests" and "The desirability of considering, in some way, applicants who have had at some time albumin in the urine."

The opinion, is, I believe, unanimous that for our purposes the most reasonable and satisfactory tests for albumin are Heat and Cold Contact with Nitric Acid, but as to who shall make these tests, there is a wide difference of opinion. I find no company which does not after some test or in some way consider those who have had albumin, but by what test or in what way, there is no regularity.

It is therefore safe for us to assume that we should do something with these cases, and that as tests for albumin at the present time, those of Heat and Cold Contact with Nitric Acid are the most practicable in their application.

It has been satisfactorily established by chemists of repute that if the test is sufficiently delicate, albumin may be detected in the twenty-four-hour renal output of all persons. So that when we speak of the significance of albumin, we do not mean exactly that, but rather the significance of a detectable trace of albumin, when ordinary tests are used.

The efficiency of any test, particularly that of Cold Contact with Nitric Acid, depends to so great an extent upon the training, efficiency and technique of the individual who uses it, that we must establish a standard in order that we may have some definite amount which we consider as detectable.

I have chosen as that standard, the expert one; that is the amount of albumin which a man, after long training and experience, with technique developed to a high, if not the

highest degree, is able to detect by the use of these ordinary tests.

Examinations for casts are probably even more variable than those for albumin, and to them, for the same reason, the expert standard must be applied, with some additional statement as to technique.

Under ordinary circumstances, the sediment is obtained either by standing for from six to eighteen hours, and examining a portion of that sediment, or by centrifugalizing a portion of the sample which is furnished. By either of these methods but a portion of the sediment which might be obtained from the sample submitted is examined.

The method employed in our Laboratory, and which is here brought forward as a standard, is in all doubtful and apparently normal specimens to allow the sample to stand for twelve to eighteen hours, decant the upper fluid and centrifugalize the sediment, all of the true sediment being then placed on two or three slides, and carefully studied. As will be readily seen, if casts even in very small numbers are present, the probability of their discovery is largely increased by this method.

It should be appreciated that the standards are high ones, and that the proportion of urines in which albumin or albumin and casts is detected, will be considerably larger than where the examination is made by those not equally capable.

In the list of cases reported herewith four authors—Mörner, Henschen, De la Celle de Chateaubourg, Posner—report classes of individuals in whom albumin was found in 100 per cent. Twelve authors report twenty-three classes in which it was found in from 50 per cent. to 100 per cent. On the other hand, we find three groups reported in which no albumin was found, eighteen groups in which it was detected in less than 5 per cent. The very large variation in these reports depends upon the investigator and the method employed, and it is noticeable that of those reporting above 50 per cent., all are chemists or specialists; while of the classes reported below 5 per cent., twelve were either applicants for life insurance or reported by life-insurance men.

The higher groups were therefore reported by those particularly qualified to make an expert examination. In the lower groups examinations were presumably made by ordinary practitioners and perhaps those least qualified to make accurate or refined tests.

While it is undoubtedly true that in certain cases a report of albumin is made by an inexperienced examiner when it does not really exist, it is my experience that the number is considerably greater where albumin is found on expert examination which has been missed by the average examiner.

Certainly this statement is accurate when applied to examinations that are up to the standard which I have suggested, and is reasonably well demonstrated by the fact that out of the last 600 examinations which were made in our Laboratory in which renal albumin was detected, renal casts were found in 94 per cent., while renal casts without albumin were only found in about 4 per cent. As renal casts are themselves albuminous it is, of course, absurd to say that they are present in the urine without albumin, it simply means that the test for albumin was not sufficiently delicate to detect it; so it is not unreasonable to say that at least in some of these other cases casts would have been found had they been searched for with sufficient persistence.

For these reasons, it is, I believe, safe to assume when the character and ability of the examiner is unknown, as it is in many groups of cases which were reported and which will be embodied in our statistics, that had the same cases been examined by an expert the percentage of albumin would have been higher.

In course of the preparation of this paper, and incidentally for use in it, in so far as was practicable, the entire medical literature of the subject for the past thirty years has been read, abstracted and condensed. This has necessitated the translation of several thousand articles, and I have attempted to give the consensus of medical opinion together with such short abstracts as would give a fair idea of individual opinions which were different from the general opinion or were worthy of special expression.

VARIETIES.—In the urine, in health and disease, there are found, either regularly or at intervals, certain albuminoid bodies which have been subdivided into a number of groups. To these bodies there have been applied a variety of names, frequently two or three to one body, and to their presence have been ascribed important diagnostic values by various observers. The names most commonly applied have been serum-albumin, serum-globulin, nuclealbumin or mucin, peptone, propeptone, protoalbumose and albumose, deuteroalbumose, heteroalbumose, acid albumin, alkaline albumin and fibrin. The relative and actual importance of these several forms has been seriously and widely discussed, and the differences of opinion which still exist demonstrate a lack of knowledge as to the actual value of the findings.

In order that a paper of this sort shall be kept within reasonable bounds it is necessary, if possible, for us to simplify the subject as it presents itself in medical literature. Some of these albuminoid bodies are known to be present in normal urine, others are never or very rarely found singly, and another group reacts to the common tests for albumin. So far as I am able to judge from a study of the literature, it is far from settled that any definite meaning can be attached to the finding of one more than another.

(Butler, 1904,—“Several albumins may be met with in the urine, of which serum-albumin and serum-globulin are of the most clinical importance. The term albuminuria is understood as indicating the presence of one or both, usually both, in the urine.” Kalisli, 1903,—“The albuminoid bodies which occur in all normal urine are nuclealbumin and mucin.” Kraus, 1903,—“It is not proper to designate every admixture of albuminoids in the urine as albuminuria, the term should be reserved for the presence of serum-albumin and globulin, while albumosuria, peptonuria, fibrinuria and nuclealbuminuria should be considered separately.” Jackson, 1891,—“Albumin is present in the urine in several different forms, the most common is serum-albumin and with this is often found globulin. Both are detected by the usual chemical tests for albumin, and globulin does not

occur independently of serum-albumin." Arnozan, 1896,—"There is nothing fixed with regard to the quantity, character and variety of the albuminoid bodies which we find in the urine. The usual opinion is that we find two types, serum-albumin and serum-globulin, which we easily recognize and distinguish, and another class which by some is claimed to be important; and that each of these varieties would correspond, if not with a distinct disease, at least with special nutritive trouble, hence the diagnosis and prognosis must rest on the precise distinction of the varieties of urinary albumins, which reasoning seems plausible, but the premises are wrong." Senator, 1905,—“In very rare cases only one of the albuminous substances has been found in the urine, and such cases are therefore designated as simple serinuria, globulinuria and nuclealbuminuria." Möerner has shown that "the substance found by the usual methods to be nuclealbumin is really albumin in combination with substances that precipitate albumin. It is probable, therefore, that everything that has been written about nuclealbuminuria refers to such combinations of albumin and not to a true nuclealbumin.")

Globulin.—The question as to whether or not the presence of serum-globulin in the urine admits of a different interpretation from that of serum-albumin is one upon which there is a wide difference of opinion. The line is quite sharply drawn between those who apparently believe that they are separate bodies due to entirely different causes which may be easily differentiated, and those who believe that while they differ in their chemical formula, they are usually, though not always, found together, and if there is any difference in the cause of their appearance in the urine it is but one of degree.

(Prout, 1900,—“Serum-albumin and serum-globulin are normal elements of the blood.” Dresser, 1902,—quotes Finot who examined a number of healthy youths of a military school and found in almost every case globulin present in the morning, while in the afternoon or evening serum-albumin was most constant. Schurmayer, 1893,—“Globulin is rarely

ever found in the urine, but when it is, is most frequently associated with serum albumin." Mitchell, 1897,—“Globulin does not occur in normal urine; its occurrence without serum albumin is very rare, if it occurs at all without it.” Cloetta, 1903,—“It has been demonstrated that, as a rule, globulin is never absent in acute nephritis.” Heynsius concludes that the presence of globulin in the urine furnishes no index to the nature of the disease.)

Albumose.—As to the significance of albumose in the urine, like that of globulin, there is much difference of opinion. In a general way, the majority of authors believe that the presence of albumose is significant, as it represents a more definite failure of metabolism than do the other albuminoid bodies commonly found in the urine, and yet to this statement there are objections by many authors.

(Gillespie, 1896, doubts if the occurrence of albumose in the urine is of much clinical importance; the presence however, of any form of proteid in the urine should not be regarded as a light matter. Bedford, 1904,—“The clinical significance of albumosuria is at present uncertain further than that its occurrence is usually pathological.”)

Nucleoalbumin.—Whether or not nucleoalbumin is really found with any frequency is open to discussion, although undoubtedly the majority of authors consider that its presence is common. Also the relation of mucin to nucleoalbumin, and the interpretation of its presence when it occurs, has caused much discussion.

(Obermeyer, 1892,—“Renal nucleoalbuminuria is due to an impairment of the epithelial tissues of the kidney.” Freitag, 1890,—“Recent researches have shown that the mucus of the urine does not contain mucin but nucleoalbumin.” Cloetta, 1903,—“The more acute the nephritis, the larger the amount of globulin and nucleoalbumin, and proportionately the less albumin.” Senator, 1905,—“It is probable, therefore, that everything that has been written about nucleoalbumin refers to such combinations of albumin and not to true nucleoalbumin.”)

Peptone.—(Kaliski, 1902,—“Peptone is physiologically

the end product of albumin digestion, but albuminuria bears no relation to peptonuria, the latter occurring in perfectly sound kidneys." Memminger, 1899,—“Peptone does not occur in normal urine and its presence is considered by some to be due to disintegration of pus corpuscles.” Gerhart, 1871,—“If albuminuria is almost wholly to be taken as a symptom of the existence of pressure within the renal arteries, peptonuria, inasmuch as it points toward extensive disturbance of metabolism, might prove of even greater value.” Freitag, 1898,—“Peptonuria offers a more unfavorable prognosis than albuminuria.” Senator, 1905,—“Peptonuria occurs only in extremely rare cases, the substance which was regarded as true peptone being in all probability one of the albumoses, the varieties of which are difficult to distinguish from each other and from peptone.”)

Whatever may be the difficulties in distinguishing the various albuminoid bodies from each other when the test is made under the best conditions and by trained chemists, it is apparent that when the examination is made by our medical examiners in active practice in the field, such differentiation, if it be made, will fail in accuracy.

Certainly if the presence of globulin, albumose, peptone and nuclealbumin have a different and important significance, we have not as yet reached the point where it is possible for us to use these facts for any practical life insurance purposes, and so far as I am able to judge, attempts to establish a diagnosis by such differentiation have failed. In my opinion, the use of these terms and attempts at refined chemical analysis have served to confuse rather than clear up the question which we have under discussion. In a general way, those who have gone deepest into the interpretation of the presence of globulin have reached the conclusion that it represents an irritation or congestion, a mild or catarrhal inflammation of the kidney, in other words, a condition of the same general character but less in degree than that which is shown by the presence of serum-albumin. For these reasons the term albuminuria, as used in this paper, should be understood as meaning the presence in the urine of an albuminoid

substance in detectable quantities which reacts to the ordinary nitric acid and heat tests, and the question as to whether this substance be serum albumin or some other will not be considered.

FREQUENCY.—It has been satisfactorily established that by the use of sufficiently delicate tests albumin may be detected, either in all normal urines, or at frequent intervals in the urine of all normal persons. While there is some difference of opinion as to whether, even by the most delicate tests, albumin can always be detected, the majority of observations, and certainly the weight of evidence, is strongly in favor of this theory.

(Grainger Stewart, 1886,—“The presence of albumin in the urine is much more common than was formerly supposed among healthy people.” “It has been demonstrated in one-third of all subjects, the frequency increasing with age.” Edes, 1888, quotes Gull as saying, “Albuminuria is as common as spermatorrhœa.” Dodson, 1889,—“Albumin is now known to be an occasional constituent of the urine of perfectly healthy individuals.” Delafield, 1895,—“The examination of urine by physicians of life insurance companies and others who have examined school children, soldiers, etc., brings out the fact that albumin is present in the urine of many persons who have no disease of the kidneys.” Charles, 1891,—“It may now be accepted that albumin is occasionally present in the urine of healthy persons.” Edes, 1888,—“The presence of albumin in minute traces, or something which gives a similar reaction with the most delicate reagents, is much more common than its absence.” Kuttner, 1902, observed albuminuria minima in most cases of otherwise healthy persons. Roberts,—“Concentrated urines from persons of undoubted health are comparatively rarely free from traces of albumin.” Spaeth, 1897,—“In perfectly normal urine there occurs only traces of albumin which is mucin rather than serum albumin.” Penzoldt, 1893,—“There is no longer any doubt that there exists albumin in the urine of the majority of healthy persons.” Finot made repeated examinations of 17 pupils of a military school for

35 days, and found albumin some time or other in all but three. Auld, 1886,—“It is not improbable that a little albumin is now and then passed by every one in sufficient quantity to be easily recognized by the ordinary tests.” Dresser, 1902, quotes Kühne as first demonstrating that the urine of perfectly healthy persons may contain albumin, and said that all urine contains normally traces of albumin. Mörner,—“All urine contains a slight quantity of albumin.” Grainger Stewart, 1892,—“I have come to the conclusion that albumin really exists in all normal urine in minimum quantities.” Dickinson, 1889, examined 81 supposedly normal individuals. By the picric acid test albumin was found in 35; when tested by the double iodides of mercury and potassium, albumin was demonstrated in all. Washburn reports the examination of the urine of 50 persons with picric acid and other delicate tests, finding albumin in all. Posner, 1886,—“Any normal urine contains traces of albuminous bodies which may be clearly and easily demonstrated by tests sufficiently delicate.” Pribram, 1903,—“It is to be considered that the urine of adult men and women contains albumin as a rule.” Levison,—“The presence of some form of proteid material in the urine is definitely recognized as occurring in all healthy individuals.” Simidar,—“The normal quantity of albumin found present in all urines is demonstrable only by special methods, and then only in minute traces. Physiological albuminuria is an increase over this amount but still within physiologic limits, and is demonstrated by ordinary methods.” Senator, 1886 —“It is no longer a theory but an established fact that normal urine contains albumin, and that this albumin is excreted normally through the glomeruli.” Senator, 1905,—“It has been proved beyond the possibility of a doubt by Mörner that serum albumin is a normal constituent of the urine in quantities of from 28 to 72 m. g. m. to the litre.”)

Albumin, therefore, resembles other substances which were formerly regarded as abnormal constituents of the urine, and which later by improved methods of analysis have been demonstrated to be normal constituents, although present

in minute quantities, as sugar, inosit, oxalic acid, urobilin, indican, fat, etc.

In the following table will be found the majority of those cases which have been reported in medical literature during the past thirty years in which the individuals making up the groups were apparently healthy at the time of the examination. A very large number of other cases have been reported taken from hospitals, private practice and various institutions, that were at least open to the suspicion of having, if not heart or Bright's disease, some other illness or condition which threw them out of the normal class. From this table have been eliminated all groups where it was definitely stated that the examination had been made by means of unusual or extremely delicate tests.

INVESTIGATOR	CLASS OF CASES	No.	ALB.	%
Mörner	Men and women	52	52	100
Henschen	Ski-runners after a race.	..	..	100 to 18.7
De La Celle de Chateaubourg	Healthy persons at rest	701	..	100 to 76
"	After vaccination	31	31	100
"	" cold bath	53	53	100
Posner	All cases	70	70	100
Roberts	App. for life ins.	31	29	93.5
De La Celle de Chateaubourg	Students	50	46	92
"	Infantry after exer- cising	111	100	90
Capitan	Children	97	86	88.7
Millard	Soldiers after severe exercise	199	170	85.42
De La Celle de Chateaubourg	Healthy persons after exercise	701	592	84.4
"	Children 6 to 15 years	61	49	80.3
"	Infantry while exer- cising	86	70	79.6
"	Soldiers after food	94	74	78.7

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De La Celle de	Soldiers at rest	120	92	76.6
Chateaubourg				
"	Infantry	120	92	76.6
"	Children 6 to 15	81	62	76.5
Saunby	Healthy persons	145	105	72.4
Grainger Stewart	Workhouse inmates	40	26	65
	over 60			
Stirling	Boys in band	..	..	60
Millard	Soldiers after rest	98	54	55.1
Flensburg	Soldiers	53	29	54.7
Caignard	"	480	235	49
Capitan	"	98	44	44.9
Stirling	Men	92	41	44.5
Eliott	—	1000	440	44
Capitan	Soldiers	100	44	44
Kleugden	Attendants in insane	32	14	43.7
	asylum			
Charles	Students	72	31	43.1
Van Noorden	Soldiers after drill	..	..	43
Dickinson	—	81	35	43.2
Finot	Military cadets after	..	..	41.2
	fencing			
Capitan	Children	..	..	41
Lömmel	Men	436	164	37.6
Grainger Stewart	Soldiers	505	189	37.4
"	"	407	129	31.7
Van Noorden	—	437	137	31.5
Grainger Stewart	All cases	..	..	31
Mason	Men and boys	13	4	30.8
Fox	App. for life ins.	282	86	30.5
Tiemann	Young men	104	31	29.8
Grainger Stewart	Soldiers after long	63	18	28.5
	march			
Rapp	Cadets after exercise	105	29	27.6
Charles	Students before exam.	110	30	27.3
Saunby	Healthy persons	461	118	25.6
Stone	Women and girls	1248	298	23.9
Charles	Students after dinner	101	24	23.8

INVESTIGATOR	CLASS OF CASES	NO.	ALB.	%
Peterson	Children	304	71	23.4
Levison	Men	254	59	23.2
Stirling	Boys	369	77	20.9
Charles	Soldiers	50	10	20
von Leube	Workmen	122	24	19.7
Charles	Students, A. M.	51	10	19.6
Lömmel	Young men	587	111	18.9
Charles	Students after breakfast	150	28	18.7
Flensburg	Soldiers after bath	..	..	18.6
Levison	Women	82	15	18.3
Stewart	Children	40	7	17.5
Van Noorden	Soldiers at rest	..	..	17
Finot	Military cadets after horseback riding	..	..	17
von Leube	Soldiers, P.M.	..	..	16
"	Healthy soldiers	119	19	16
Hall	App. for life ins.	19	3	15.8
Mahomed	App. for life ins.	77	12	15.9
Hwass	Soldiers	559	85	15.2
"	Swedish soldiers	635	95	15
Clark	Students after exam.	20	3	15
Brown	App. for life ins.	365	54	14.8
Brannan	"	365	54	14.8
Zechinson	Cases	144	21	14.6
Charles	Students	258	34	13.2
Rapp	Cadets	142	18	12.7
Charles	Workhouse Inmates	275	33	12
Fürbinger	Children	61	7	11.5
Owen	App. for life ins.	..	..	11
Hall	"	..	..	11
Munroe	"	220	24	10.9
Grainger Stewart	Civilians	74	8	10.8
Rapp	Cadets after dinner	1572	168	10.7
Edes	All Cases	10-20
Peterson & Pey- kull	"	10-14
Hall	App. for life ins.	..	26	2-10

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Munn	App. for life ins.	630	59	9.4
Van Noorden	Soldiers	53	5	9.4
Tiemann	App. for life ins.	2000	180	9
Flensburg	Soldiers	1252	97	7.7
Charles	Students before break- fast	102	7	6.9
Flensburg	Soldiers before bath	..	..	6.4
"	" noon	..	..	6.1
Moore	App. for life ins.	8000	480	6.0
Washburn	"	338	20	5.9
Leroux	Children	330	19	5.8
Shepherd et al.	Employees	127	7	5.5
Finot	Military Cadets	..	..	5.5
Eng. Ins. Cos.	App. for life ins.	2395	119	5
Flensburg	Soldiers, night	..	..	5
Symonds	App. for life ins.	..	..	5
Bexilius	Peasants	150	7	4.7
von Leube	Soldiers	..	..	4.2
von Petersen	"	1000	37	3.7
Meigs	—	1700	62	3.6
Bexilius	All Cases	..	..	3.5
Washburn	App. for life ins.	7500	258	3.4
Eng. Ins. Cos.	Soldiers	40	1	2.5
Flensburg	" morning	..	..	2.1
Shepherd	—	35471	709	2.0
" et al.	Civilians	1677	20	1.2
" "	"	711	7	1.0
West	App. for life ins.	750	7	.9
Shepherd et al.	Machinists	575	4	.7
Eng. Ins. Cos.	App. for ilfe ins.	31125	185	.6
West	App. for life ins. be- tween 25-30	7950	25	.3
Shepherd et al.	Militia	254	0	.0
" "	Musicians	15	0	.0
Hailey	" Soldiers of India	200	0	.0

CAUSE.—It has been demonstrated that albumin, as such, is present in all normal urine; this, however, applies to small quantities that may not be detected by the ordinary tests.

Detectable traces, that is detectable by the ordinary methods, have been demonstrated in large percentages of normal individuals under a great variety of ordinary conditions, as well as in many instances without known cause. The whole subject has been complicated by the use of various terms, such as muscular, dietetic, and postural albuminurias, as well as that of adolescence. These terms will not be used in this paper as there is no reason to believe them of value.

It has been clearly demonstrated that the amount of albumin normally present in the urine may be largely increased by exercise, diet, cold baths, exposure to cold, mental or nervous excitement, strain or work. Groups of cases have been reported in which, under certain conditions, all persons examined have had albumin. Some of these groups are ski-runners after racing, healthy individuals after vaccination and cold baths, boxers, long distance runners, pedestrians, baseball players, boat crews, cyclists, and in fact it would appear that, when carefully examined by the ordinary tests, 100 per cent. of all individuals after severe exercise or any condition associated with marked increase in blood pressure or congestion of the kidneys will show albumin in the urine.

In other forms of less severe exercise, such as marching and drilling of soldiers, playing of wind instruments, fencing, exercise in gymnasiums and horseback riding, the percentage in which albumin has been found is very large. Mental work and nervous tension, such as is associated with examinations, business stress, or prolonged mental and nervous strain of any character, have also been shown to produce albumin in a large proportion of individuals. The ingestion of beef, eggs or other strongly albuminous food, even in moderate amount, in ordinary and normal individuals will materially increase the amount of albumin present.

While a very considerable number of such groups have been reported, they are usually limited to the more severe forms of mental or physical exercise. The amount of albumin which has been detected after heavy exercise has frequently reached from $\frac{1}{4}$ per cent. to $\frac{1}{2}$ per cent., and it is fair to assume that the lighter exercise and food of more ordinary oc-

cupations would, in a large number of individuals, cause an albuminuria sufficient to be readily detected.

(Semmola, 1882, "Albumin is not a principle which is intended normally to pass out of the living economy. The relation of albuminoids to albuminuria is the same as that of glucose to glycosuria. In health both of these principles circulate in the blood and neither is intended to be eliminated. Whenever their quantity or quality becomes such that they are no longer suitable for carrying out their physiological purpose they are eliminated as useless substances foreign to nutrition." New, 1884, "Why does the urine not normally contain albumin? Because it is reabsorbed by the renal epithelium as it passes along the tubules and not as a result of any special function of the glomeruli. The principal causes of albumin are increased tension in the glomeruli or inflammatory degenerative changes in the renal epithelium; the first causes increase in the escape of albumin, the second interferes with its proper reabsorption." Pavy, "There are other conditions, in themselves not to be spoken of as morbid, but constituting only ordinary conditions of life, which may prove productive of albumin." Middleton, 1894, "If a condition of the epithelial lining of the tubules were induced by any cause similar to the changes we know occur in the epithelium of the stomach and intestines, as in dyspepsia, it is evident that small quantities of albumin might thus escape reabsorption on account of the impairment of function of small portions of the kidney tissue." Spiegler, 1894, "Anything which affects or involves the bodily and physical equilibrium may lead to the excretion of albumin via the urine. Bodily exertion or grave mental phenomena in healthy individuals may produce albuminuria, and the author has also found that much lighter disturbances will produce it." He quotes Infield who reported one hundred men with scabies, all of whom had albuminuria. Adams, 1898, "Anything lowering the vitality or affecting the nervous system may increase faulty assimilation, and with it the irritation and congestion which produce albuminuria." Kinnicutt 1882, "In children, the most common causes for temporary albuminuria

are oxaluria or lithuria, the presence of a large amount of imperfectly oxidized material in the circulation, disturbances of the general nervous system, causing transient dilatation of the blood vessels of the kidney or retardation of the blood current." Barrs, in citing the conditions under which albumin appears in the urine, speaks of poisons, pyrexia, cardiac disease, also of all varieties of disturbances of the bodily functions, conditions of exercise and fatigue, feeding and varieties of food, blood dyscrasæ, and of malaria and syphilis. Auld, 1886, "A great many causes of transient and cyclic albuminuria may briefly be said to be due to debility. In the strong person, nervous shock, gymnasium exercise or a night's dissipation will not be likely to be followed by albuminuria, but if the tissues are vitiated various conditions of the vessels arise which readily explain its occurrence." Hyde, 1904, quotes Osler, who gives five varieties of albumin without coarse lesions of the kidneys: functional, febrile, hæmic, all buminuria of pregnancy, and that of nervous affections. Clark, 1884, gives four types worthy of further consideration, nervous, oxaluric, gouty and hepatic. Lichty, 1895, "There are ten or twelve varieties mentioned by various authorities, but the underlying cause is always some irritant that has disturbed the kidney itself or some other part of the urinary tract." Purdy, "Albuminuria is always due, first, to changes in the kidneys themselves; second, the quality of the blood; and third, alteration in blood pressure." Mitchell, 1897, "Circulatory disturbances, central nervous disease, disease altering the quality of the blood, mechanical pressure, poisons, are all commonly responsible for albumin in the urine." Adams, 1898, "High specific gravity is ordinarily present; it is usually due to congestion of the kidneys with slight local inflammation of the cortex. The kidneys are secondarily affected by the throwing off of waste products." Purdy, 1904, "Disturbances of the circulation may bring about albuminuria without structural change in the kidneys." Purdy, 1901, "Circulatory disturbances, in order to produce albuminuria, must include the renal vessels. Probably this cause is responsible for that large class of cases of so-called physiological or func-

tional albuminuria." Heitzman, 1897, "Disturbances of circulation, due to a variety of causes, bring about the presence of albumin without any structural changes in the kidneys." Jenkins, 1905, "Albuminuria, due to changes in the blood, is found in all hydræmic conditions, also after modifications in blood pressure." Fiske, 1883, "If there be a disturbance of circulation, either general or simply renal, albumin is wont to make its appearance in the urine." Gerhart, 1871, "Albuminuria is almost wholly to be taken as a symptom of the existence of abnormal pressure in the renal arteries." Moore, 1899, "Albumin may appear in the urine upon slight variations in the mechanical conditions of the circulation of the kidney." Grainger Stewart, 1886, "Albuminuria is more common among the hard-working classes than in those whose occupation is less arduous. It frequently follows the eating of food, violent and prolonged exercise, and cold baths." Walbridge, 1896, "Albuminuria occurs in healthy subjects when there is an excess of albumin in the blood. The withdrawal of salt from the diet will produce it, the albumin disappearing when the salt is given again." Mahomed, 1884, "It has been ascertained that albumin can be produced in healthy persons by cold bathing, by a diet consisting largely of egg albumen, a highly nitrogenous diet, or by excessive muscular exercise. It is always present in larger quantities in the urine passed in the forenoon and after breakfast than at any other time during the day." Pribram, 1903, "Albuminuria is excited by the feeding of eggs, and is always present after cold baths." Mitchell, 1892, "Albuminuria may follow severe muscular or mental exercise, cold baths, hearty meals, the presence of abundant uric acid or oxalate of lime crystals." Greene, 1905, "It must be admitted that albuminuria may follow emotional disturbance, violent exercise, cold baths and the ingestion of excessive amounts of nitrogenous foods." Jenkins, 1905, "It may occur without any apparent cause or after exercise, fatigue or the ingestion of large amounts of albuminous foods." Ascoli and Bonfanti, 1903, demonstrated that in previously clear urines albumin might be detected, even in the horizontal position, after beef had been eaten. Adams,

1898, "Albuminuria promptly follows the taking of food and is more common after breakfast, while frequently absent after the evening meal." Pommerehue mentions light exercise, standing, change from the horizontal to the erect position. Porter, 1901, speaks of increased blood pressure, muscular exertion, nerve shock and long-continued pain as causes of albuminuria. Purdy, 1894, "When the heart is powerfully called upon, albuminuria is frequently noted as a result, as in soldiers on long marches, attacks upon the nerve centres, mental workers and students preparing for examinations." Pye-Smith, 1903, mentions driving in the cold, blowing of wind instruments, football, athletic sports, cold baths, etc. Dresser, 1902, quotes Finot, "The especial cause for the excretion of serum-albumin is congestion of the kidney as produced by horseback riding." Mueller reports eight cases of trained cyclists, in whom, after a fatiguing ride, there appeared albumin which even with the microscope was absolutely indistinguishable from that of a true nephritis. It disappeared after a few days. Deas, 1901, after mentioning the various causes, concludes that in every case of functional albuminuria there is a congestion of the kidney. Rem Picci observed the effect of cold baths with a temperature of from 9 to 12° C. where the individuals remained in the water for three minutes. The urine was normal before the baths, afterward albumin appeared in every case, frequently with casts. Albumin was invariable after baths with a temperature below 12° C. and variable when the temperature was above 15° C. Clunes, 1897, "Cold sea bathing is also known to cause albuminuria at times. In such cases there is doubtless some renal engorgement which coupled with the high arterial tension consequent upon the efforts put forth in swimming are sufficient to account for the albumin." McFarlane, 1894, quotes Lambert, who found that when the temperature goes to zero or below, or when it passes 90° F., the percentage of healthy men having albuminuria increases from 2 per cent. to 5 per cent. Gray has found persistent albuminuria with frequent hyaline casts in almost all his cases of functional nervous disease. Marie, 1900, "One well-established cause is heredity; position

has its influence, as does irritation of the kidney by the passage of oxalates." Oswald found that calcium oxalate in the blood may cause albuminuria. Engel, 1903, refers to several cases of falls from a horse in which albuminuria resulted, none being present before the accident.)

PROGNOSIS.—Questions as to the interpretation, importance and prognosis of albuminuria have been further complicated by the use of descriptive terms which, when applied to the word albuminuria, are supposed to represent its cause, prognosis or the time or age of its appearance. Such are muscular, dietetic, postural, paroxysmal, intermittent, temporary, cyclic, simple persistent, physiological, functional, and the albuminuria of adolescence, and many arguments have been made and much time taken up in discussions as to whether physiological albuminuria represents a disease, whether functional albuminuria is of organic origin, and whether transient, intermittent and cyclic albuminurias are really permanent. Such arguments are certainly valueless, if they are not on their face absurd, and time spent on these discussions is worse than wasted.

It is, I believe, conceded at this time by the majority of those who have given study or thought to the subject, that albumin in detectable traces is neither always present in organic disease of the kidneys, nor always absent in the urine of normal individuals. The variety of opinions that have been expressed is certainly remarkable, and after a study of the subject it does not seem as if there could well be a new one. There is probably no one point upon which authorities agree to-day, and in order that we may have some more definite idea as to the present position of students of the subject, it seems advisable to include a variety of opinions covering the essentially important points which have been made by the advocates of these various positions.

(Griffith, 1895, "The significance of the presence of serum albumin is a subject far too great for discussion." Purdy, 1901, "A healthy appearance, or a healthy normal personal record, carries less weight in reaching conclusions as to certain pathological conditions of the kidneys than in any other

disease." Barrs, 1899, "To regard a case of chronic Bright's disease as one of functional albuminuria is to make the gravest error in prognosis that one can possibly make, while on the other hand, to regard a case of functional albuminuria as one of Bright's disease is to condemn a practically healthy person to invalidism." Hyde, 1904, "For my part, it means invariable disease of the kidney, if not actually present, at least a susceptibility. Physiological albuminuria does not occur. To-day, the discovery of albumin in the urine means, I think, only this, that somewhere along the urinary tract some abnormality exists." Kennedy, 1903, "Proteids are not normal constituents of the urine." Jenkins, 1905, "Albuminuria is always of local or pathological importance, the patient presenting a departure from the standard of perfect physical health. There must be an alteration in the integrity of the cells lining the uriniferous tubules before it is possible for albumin to gain entrance into the urine. Serum albumin will not pass through animal membranes under ordinary circumstances, certain alterations or departures from normal conditions being necessary before this substance can penetrate the basement membrane and appear in the urine." Bedford, 1904, "Even when there are no definite signs of renal disease, the general experience is that albuminuric patients live a shorter time, and that their health tends to become gradually worse." Winternitz, 1891, "The presence of albumin does not belong to our understanding of normal urine." Johnson, 1889, "In almost every instance these cases of albuminuria may be traced back to some recognized exciting cause. The majority of cases of intermittent albuminuria may be traced back to a more or less remote attack of acute nephritis." Simidar, 1897, "All marked albuminurias are therefore to be considered pathologic." Greene, 1905, "The term physiological is almost invariably misapplied to cases of unrecognized disease of the heart or kidneys." Pye-Smith, 1903, "No healthy person can produce albuminuria by anything he can do, by moderate exercise, eating eggs or any other means. It is always a morbid symptom." Porter, 1891, "If the renal organs be not overtaxed, and their vitality and integrity is main-

tained, albumin cannot and will not appear in the urine." Washburn, 1893, quotes Rabagliati, who "is entirely out of sympathy with those who are disposed to take a favorable view of cases in which even a trace of albumin is present." Brannan, "All cases untreated will eventuate in organic renal disease." Vanderpoel, 1893, "Serum albumin in noticeable quantities is never found in healthy urine, and its presence in all cases is a morbid symptom of great importance." Steven, 1884, "In a typically healthy kidney albumin never passes through the walls of the glomerular vessels; the fact of its presence in the urine is to be explained by some deterioration of the vitality, or derangement of the structure of the glomerular vessels. Increase of blood pressure of itself seldom, if ever, causes albuminuria unless associated with the changes mentioned above." Syers, 1900, "When albumin is detected in people over 30, it may safely be attributed to the presence of chronic renal disease." Ott, 1894, "Intermittent albuminuria, in the majority of cases, is due to a latent chronic inflammation of one or both kidneys, and is to be regarded as chronic nephritis." Johnson, 1884, "The smallest trace of albumin is always pathologic." Butler, 1904, "Probably the presence of albumin in the urine always implies some interference with the integrity of the epithelial cells of the renal tubules, which, when intact, prevent the passage of the proteids of the blood into the urine." Shepherd, 1886, "Albumin is not a constituent of healthy urine and therefore when found is evidence of a morbid condition of the system." Lichty, 1895, "So-called physiological albuminuria is to be looked upon with suspicion. Normal urine should give no reaction with the usual tests for albumin." De Haviland, "The occurrence of physiological albuminuria in adolescence is not rare and not to be looked upon with fear, but albumin in the urine of a man of forty is very suspicious." Kraus, 1893, "But this does not infer that any albuminuria should be considered the result of positive physiologic conditions by insurance companies." Long, 1900, "Albuminous bodies do not occur in normal urine except in mere traces. Temporarily it may appear in small quantities after the ingestion of egg

albumen or after the action of some cause producing a sudden alteration of the blood pressure." Smith, 1886, "The presence of albumin in the urine can be of value only as a symptom, oftentimes only one of many to help us make a diagnosis. Good health is not compatible with well-marked albuminous urine, small amounts are of less importance." McCollom, 1888, "It is simply a finger on the guide-board pointing out the way toward that change which a proper train of questions would disclose." Gairdner, 1884, "I do not think we can, in the present state of our information, accept the expression of physiological albuminuria without some demur and perhaps some alteration in its terms. I consider that albuminuria in a practical sense is, to say the very least, a danger signal." Purdy, 1901, "It is impossible to always estimate the progress of renal changes by the quantity of albumin found in the urine." Fiske, 1883, "We think that the cases we have cited will go to prove that the severity of the disease is not at all to be diagnosed by the amount of albumin present in the urine." Arnozan, 1897, "Albumin may appear in the urine on account of slowing of the circulation, blood changes or lesions in the filtering membranes." Memminger, 1899, views "with suspicion any specimen of urine containing albumin." Pyer, 1890, "The presence of albumin, in the majority of cases, is a symptom of serious change in the uropoetic system. There are not infrequently exceptions to this rule." Sturgis, 1892, "Albumin in the urine does not necessarily signify any renal disease, it is always a danger signal." Brown, 1891, "All varieties of functional albuminuria, unless arrested, will ultimately result in changes of the renal structure." Jackson, 1891, "Never met with a single case of albuminuria in which a microscopical examination did not disclose some pathologic condition of the kidney or uropoetic system sufficient to account for the presence of the albumin." Symonds, 1898, "If the age is over 40 the prospects are much dimmed, and the author regards such cases with suspicion which increases every year." von Strumpel, 1901, "When renal albumin is found in the urine we may with certainty conclude that some derangement exists in the kidney." Washburn quotes Davis ,

"I think it very safe to conclude that there is no such thing as functional albuminuria, that in every case it is just as much an abnormal condition as nasal catarrh or hæmoptysis." Mitchell, 1897, "Albumin occurs in the urine much oftener than was formerly supposed, but functional albuminuria, this much abused term, describes a number of albuminurias which have in the past been regarded as physiological, to wit:—transitory, intermittent and cyclic." Johnson, "The absence of albumin at any period of the 24 hours, the urine being of normal color, quantity and specific gravity and free from tube casts, warrants the conclusion that there is no serious structural change in the kidneys." Talbot-Jones, 1900, "The prognosis of albuminuria in animal or meat eaters is decidedly more favorable than that of vegetarians." McFarlane, 1894, "Although I believe in the existence, under certain provocative conditions, of a functional albuminuria, I would regard it as a very great evil indeed if the knowledge of this possibility should lead any to carelessly view the presence of albumin in the urine." Neubauer and Vogel, 1890, "Albuminuria may occur in healthy individuals. A true physiological albuminuria does not exist, the prognosis depending entirely on the causal conditions." Bertrand, 1890, "The prognosis is not serious unless it is the concomitant symptoms, which may be quite serious. We should not consider this affection without importance." Ball, 1881, "Within the past decade a remarkable change has taken place with respect to the value of albumin, *per se*, as a sign of renal disease. Formerly the detection of albumin was recognized as almost a fatal symptom. It is now even seriously debated whether albumin may not, in certain cases, fall within the limits of physiological conditions." Ellis, 1888, "Albumin may make its appearance under such conditions as to show only a very slight deviation from the natural state." Freitag, 1898, "Albuminuria is to be considered physiological when the albumin does not exceed .4 to .5 per mille . . . An occasional slight albuminuria in older people is to be considered physiological." Grainger Stewart, 1892, "The quantity of albumin is not of great importance in prognosis." Tyson,

1898, "Albuminuria is least significant when the specific gravity is high." Jeanton, 1898, "Albumin has certainly a diagnostic value, but it is restricted enough when taken separately." Kuttner, "If the prognosis is exclusively dependent upon the albumin found in the urine, the only way to differentiate the grave from the milder forms is by the disappearance of the albumin." Grainger Stewart considers the prognosis hopeful if the quantity of urea is normal, the pulse and heart in a healthy condition, and there is an absence of tube casts. Clunes, 1887, "In all forms of albuminuria alluded to there is nothing to warrant the assumption that such persons are ineligible to life insurance. They should be subjected to searching inquiry, but are undoubtedly insurable on some of the forms of life insurance." Coisceau, 1897, "Albuminuria regarded alone has no absolute significance; it indicates danger but does not permit us to appreciate it. We must rely upon other elements in order to judge of the gravity of an albuminuria. Our source of information is the urine and we must fully consider its composition." Arnozan, 1897, "Considered from a diagnostic point of view, it is a very unreliable symptom, which may mislead with regard to the gravity of the lesions; the composition of the urine is then of greater importance. It is the renal function and not the amount of albumin which makes the prognosis." Pavy, 1898, "I do not consider that medical knowledge is at present in the condition to enable us to differentiate these cases from those which will develop into a marked Bright's disease." Green, 1905, quotes Lambert, "I think this question of albuminuria is broader and deeper than the mere question of what a subject will die of. It seems to me that albumin in the urine is an indication of something wrong with the physical condition of the individual, and that it is a red flag of danger bidding us go very slow." Husband, 1891, "Albumin is absent, as a rule, but may be present now and then in healthy persons. The mere presence of albumin is not of so great importance as its persistent presence from day to day." Tyson, 1888, "It is questionable whether any person with seemingly functional albuminuria who has reached

the age of 40 should be accepted." Senator, 1895, "It is now safe to assume that the presence of albumin, or nuclealbumin, or both, is not necessarily a pathological condition." Bremer, 1895, "Albuminuria is not a disease but a symptom of a number of diseases, not only a variety of diseases but a variety of altered conditions still within physiologic limits." Grainger Stewart, 1886, "There is no sufficient proof that albumin is normally discharged from the human kidneys, the existence of the albuminuria itself is not sufficient ground for rejection in life insurance." Bond, 1890, "Some persons may pass small quantities of albumin for years and have no serious disease. It points, if in any direction, toward a common pathological condition involving wide areas of the body." Gordon, 1902, "If transient albuminuria is not to be regarded as a normal occurrence, it should be taken as an indication of disordered health." Shattuck, 1894, "Whether there be a physiological albuminuria is largely a matter of definition of the word physiological." Simidar, 1897, made a number of experiments with animals and found physiological albuminuria to occur in animals as well as men. Edes, 1888, "The relation of albuminuria in these cases to a future nephritis is not unlike that of a slight cough to future tuberculosis; it would induce a search for other symptoms and call for attention to the general health." Sherrill, 1896, "Albumin is not found normally in appreciable quantities; its presence may indicate departure from normal conditions and may be due to modifications in the blood pressure, violent exercise, fatigue, exposure to cold, and nervous derangement of the system." Barrs, 1899, "To make a case of functional albuminuria, then, we require a practically normal urine having in solution serum albumin." von Strumpel, 1889, "Observations have proven that slight albuminuria may occur in healthy persons." Stone, 1898, "By itself, albuminuria is of no prognostic value and needs other factors in order that judgment may be given on the case." Danforth, "I have long since come to regard transitory albuminuria as of little importance." Klemperer, "Cyclic albuminuria exhibits no signs of Bright's disease. Its course is chronic, it is the

source of no danger to life and it does not become transformed into serious disease of the kidneys." Senator, "Normal urine may contain albumin and consequently no unfavorable outlook attaches to the presence of transitory or paroxysmal albuminuria." Roberts, "Prognosis in functional albuminuria is favorable. It is now certain that a sensible albuminuria is a much commoner occurrence in healthy persons than has been hitherto supposed." Clunes, 1887, "The mere presence of albumin in the urine of an applicant for life insurance is not sufficient evidence upon which to base the conclusion that pathological changes are taking place in the kidney." Tuttle, 1900, quotes Saundby, "Albuminuria occurs in healthy persons"; and Richardson, "There is a form of albuminuria in which there is no renal disease whatever, nor actual organic disease of any organ of the body." Bond, 1890, "Albumin is found in the urine in large quantities without necessarily emanating from diseased kidneys." Jackson, 1891, "Minute traces of albumin can undoubtedly be found in the urine of persons in perfect health." Teissier does not believe that this form of albuminuria (cyclic) is likely to pass into a true nephritis." Cole, "Albuminuria does not itself indicate Bright's disease." Mahomed, "For my part, I am quite confident that we may have albuminuria with practically healthy kidneys." Goldstein, 1894, "Albumin in the urine is a physiological condition and it does not necessarily imply nephritis." Finlayson, 1884, "I am prepared to admit that we may have albuminuria at times in healthy persons." Cammercasse, 1897, "This symptom of albuminuria has no prognostic signification but has some prognostic value. The presence of albumin in the urine means that the patient is on the way to poison himself, that the waste products of the body are produced in too great quantities." Kelley, 1902, "The occurrence of physiological albuminuria is now conceded, especially in the young subject and males under 25." Jeanton, 1899, "Numerous observers having found albuminous urine in many and diverse affections independent of all renal lesions, and having found albumin in the urine of subjects enjoying the most perfect health, albu-

minuria becomes a symptom common to many diseases." Kuhne, 1900, "The presence of albumin in the urine of healthy persons is a long-established fact." Heitzmann, 1899, "The presence of albumin does not necessarily signify the presence of renal trouble; even a comparatively large amount may exist without any kidney lesions whatever." Wood, 1892, "Transient albuminuria is exceedingly common; frequently occurs in persons who are perfectly healthy." von Leube, 1887, "The presence of albumin in the urine of healthy persons is a physiological condition." Levison, 1899, "Albumin must be considered a normal and constant constituent of the urine." Greene, 1905, "Normal urine does not contain a sufficient amount of albumin to respond to the ordinary clinical tests. It is a distinctly pathological condition but does not necessarily mean Bright's disease." Lang, 1890, "In view of the experiments made it must be acknowledged that under certain conditions the transitory presence of albumin in small quantities is not a pathological condition." Shattuck 1894, "We can grant that renal albuminuria is always pathological, chronic pharyngitis is also pathological." Semmola, 1887, "We should absolutely give up the idea that albuminuria must always co-exist with nephritis." Saundby, 1897, "Albuminuria may be present in healthy persons and persist for long periods without causing any derangement of the general health or of the structure of the kidneys." Rattan, 1889, "It may be regarded as an established fact that the urine in health may contain at times coagulable matter, not in every sample as urea or phosphoric acid, but frequently when tested by accurate observers." Purdy, 1901, "Albuminuria, of itself, should never be accepted as a proof of renal disease. It is safer to accept albuminuria as evidence of an existing abnormal state, the gravity of which is to be determined by its accompanying symptoms." Mahomed, 1884, "I believe that the presence of any form of albumin in the urine indicates undue stress upon the renal circulation." Walbridge, 1896, "It therefore seems to me that albuminuria does not represent a pathological condition unless associated with other

and more reliable symptoms." von Leube, 1902, "It is, in my opinion, thoroughly correct to speak of a physiological albuminuria, and I consider every contention as to whether this name has been chosen correctly entirely unnecessary." Jacksch, "We are not warranted in inferring the existence of a renal lesion from the mere fact that the urine contains albumin." von Baum, 1894, "Albumin in the urine is of considerably less importance than was formerly supposed. To-day we know that albumin may be intermittently or persistently present for years and the patient enjoy excellent health. Albumin does not afford any indication of the gravity of the disease." Syers, 1902, "The quantity of albumin, *per se*, does not render it less likely that the case is one of functional albuminuria. The mere presence of albumin in the urine is not a matter of great importance." Talamon, 1896, "A small quantity of albumin in a colored urine, moderately abundant, of a normal or increased density, rich in urea and uric acid, is of benign prognosis.")

LIFE INSURANCE.—The attitude of life insurance companies towards applicants having or having had albumin found in the urine is extremely varied. It is generally assumed that if all cases presenting albumin on examination were accepted, the mortality would be excessive, as it is regarded that if all such cases were declined many perfectly safe risks would be treated unfairly. Whether or not albumin always represents a pathologic process, it is known that many such cases do not develop Bright's, or if they do, they entirely recover and their lives are not shortened. Attempts have been made in many ways to distinguish between these cases, as it is believed that, were it possible so to distinguish, many cases could probably be accepted safely at ordinary rates. The various opinions and points of view are so divergent that it is probable that no two authors have expressed themselves in the same way, and a reading of the literature on the subjects shows that little accurate knowledge has been acquired, or at least that very few definite opinions have been formulated.

The experience of a large English company showed that

Bright's disease does not account for more than 17 per cent. of all cases of albuminuria that were met with on examination. von Leube, 1903, "I find it perfectly in order that life insurance companies are very careful in receiving applicants who on examination show albuminuria without nephritic symptoms." Teissier, 1900, "I think that the mortality of such individuals (albuminurics) after infectious diseases differs little from that of well persons." At the annual meeting of the British Medical Association in 1889, fifteen prominent physicians took part in a discussion of this subject: one-third favored the acceptance of persons with albuminuria but otherwise apparently healthy at advanced rates on short terms; one-third favored postponement until the disappearance of the albuminuria; only two were in favor of outright rejection. Rabagliati said that an investigation by the Scottish Widows' Fund showed that the average age at death of persons with albuminuria was 57 years, and proposed that, where a trace of albumin was present without casts and with no other definite lesions, the life might be accepted as one having the expectancy of attaining its 57th year. Pavy, 1899, "I am of the opinion that there is always a certain risk connected with these cases. If life insurance companies should decide to admit them, it is not unreasonable that an additional premium should be charged." Pollock, "Albuminuria existing for years in persons of otherwise perfect health may be assured for a short period, say of five years, with an addition to the premium, and come again for re-examination at the end of that period."

Davis, 1891. GENERAL RULES FOR ACCEPTANCE.

" 1.—There should be nothing in the family history indicative of Bright's and there should be no symptom of renal disease in the personal history except albuminuria.

" 2.—The candidate should be under 40, in good health, and there should be no history of gout, rheumatism, syphilis, lead poisoning, nephritis, intemperance, chronic dyspepsia, or dropsy.

" 3.—There should be no indication of hypertrophy of heart

or increased arterial tension, no accentuation of the second aortic sound, and no palpitation or dyspnoea.

" 4.—No retinal changes.

" 5.—Color, density, quantity of 24 hours' urine should be normal, or it may be darker and heavier.

" 6.—The specific gravity of the 24 hours' urine should not be below 1020; it may range from 1015 to 1030.

" 7.—Precipitated albumin should not exceed one-eighth of the urine.

" 8.—There should be a period of 24 hours when the urine is free from albumin.

" 9.—Urine, as a rule, should contain no tube casts; when, however, the specific gravity and quantity of urine are normal, the presence of a few hyaline casts has no serious import.

" When above conditions have been met and we are convinced of the ability of the medical examiner and are satisfied with the completeness and carefulness with which the investigation has been made, I think we can safely approve the candidate for a short endowment policy." Mitchell, 1891, "Given that albuminuria is found in the urine of a person applying for life insurance, he should not be declined, providing, in all other respects he presents signs of good health, there are no casts, the albumin is not habitually one-fifth of the bulk of the urine, there is no albumin in the urine voided on rising, the specific gravity of the 24-hour amount is 1020 or upward, no sign of hypertrophy of the left ventricle or increase in the vascular tension, the patient is under 40, there is no true gout, retinal symptoms, or hereditary predisposition to renal disease." Syers, 1900, "If, after careful observation, at the end of three months all evidence of renal disease is absent and the general health remains good, it seems to me that the case may be accepted at slightly increased rates." Stockvis, "Life insurance companies do not accept (cyclical) albuminurias. They should not definitely refuse such cases but should repeat the examination, as the prognosis on the whole is a favorable one." Hall, 1888, "Medical officers should not recommend cases of albuminuria for acceptance where the albumin has been detected at mid-day or in the

afternoon, on boiling or by means of cold nitric acid. Edes, 1888, "Hall says albuminurics should not be assured." Pye-Smith, "No person who has albuminous urine by the usual tests can be considered eligible for life insurance." Kuttner, 1902, considers the proposition to charge the applicant an added premium as unjust, since by so doing totally innocent persons will be taxed. As long as traces of albumin are still found in the urine the prognosis must be grave. Shattuck, 1894, "Life insurance companies are right in refusing risks reported as presenting albumin and casts, but I have no doubt that risks are daily accepted by the best companies in which expert examination would detect albumin and casts." Fox, 1892, "I have come to regard the presence of a trace of albumin in cases of unstable circulation as hardly increasing the risk of a life. When a very small trace of albumin is unexplained and all other elements in the life are perfectly sound it need be no obstacle in the report, but it would have weight if other points were doubtful." Grainger Stewart, "The existence of albuminuria is not of itself a sufficient ground for rejection of a proposal for life insurance." Vire, 1900, "It is much more irrational to admit to life insurance the pleuritic who has been cured or the syphilitic who has apparently been cured than a patient with intermittent albuminuria who shows all outward signs of health, since of the first two one is more likely to become tuberculous and the second ataxic than the third is to develop nephritis." Tyson, "I am confident that certain cases of albuminuria are insurable if they can but be selected. Life insurance companies should recognize a condition of functional albuminuria out of consideration for their own interests, as well as in justice to a class which is being recognized as more numerous as our knowledge increases." Symonds, "It has been suggested that all cases of albuminuria could be insured charging them all an extra premium which could be so equalized that no loss would accrue to the company. . . . It would be like accepting all cases of cough at an extra premium, a splendid opportunity for the consumptive and cases of emphysema but very harsh treatment for ordinary colds and acute bron-

chitis." Shepherd *et al.*, "In the matter of life insurance, albumin in the urine should be looked upon as a symptom only, and the cause ascertained; the acceptance or rejection of a risk should depend upon the gravity of the case. It may, I believe, be accepted:

"First.—That albumin in minute traces is not only frequently found in normal urine, but is a normal constituent of the urine.

"Second.—That after severe exercise, mental strain, and under certain other conditions which have been noted, it is constantly found in detectable traces in individuals who give every other positive evidence of being in good health.

"Third.—That in the majority of normal individuals a much less degree of exercise or mental strain will be associated with the presence of albumin in detectable traces.

"Fourth.—That the amount of albumin has no bearing upon the prognosis, and that in normal individuals severe exercise will cause a large amount, even up to or beyond $\frac{1}{4}$ %.

"If these are facts it is not unreasonable to suppose that a moderate amount of exercise, such as we all take from time to time, will produce slight traces, but still enough to be readily recognized in the urine of healthy individuals. Other conditions, such as food, cold baths, mental worry, have been shown to produce albuminuria in a large proportion of the cases investigated. It is therefore safe to assume that under conditions to which we are all exposed, the normal individual may from time to time, show detectable traces of albumin in the urine.

"As I have suggested, I believe it to be as unwise to attempt to apply the use of such terms as physiological, functional, dietetic, postural, to the albuminuria found under any of these conditions, as it is, in the present state of our knowledge and with the present efficiency of our examining force, difficult to distinguish between the various forms of proteids which are found in the urine. Such being the fact, it is enough for us to say that while perhaps not definitely physiological, we do find albumin in the urine of distinctly insurable cases, individuals of at least average normal health. As we find it

present under such conditions so frequently we certainly cannot afford to decline, rate up, or modify all persons who have or have had albumin in the urine.

"I believe it has been demonstrated that this condition is so common that we can with safety say that every healthy man of average and ordinary life has had albumin in detectable quantities in his urine within a reasonable time. Dr. Symonds implies and Dr. Shepherd has said that albumin is but a symptom, and in my opinion it is not necessarily a serious symptom.

"My personal belief is that were we to examine the first thousand supposedly normal individuals passing a given point, albumin in the urine would be more common than any other one symptom. That is,—more common than pain, cough, increased temperature, or dyspepsia."

If we accepted all applicants with any one of these symptoms we might well expect an increased mortality, and so with albuminuria. If we declined all individuals, or postponed them for three months, six months, or a year, who had at some time a history of such conditions, our business would be materially decreased, and yet that is practically what we are doing with albuminurias; a position which I believe is entirely unwarranted by the facts. It must be obvious that our duty to this class of symptoms is the same as it is to those referable to any other organ or to any other system. We should establish the fact as to whether the organ or the system represented is normal and doing its work.

CASTS.

Cylindroids.—In order that confusion may be avoided and a clear knowledge may be had of what is meant by casts, it should be understood that in this article the word "casts" refers to a mould of a renal tubule; plugs from the prostate and urethra are not included, neither is a mould of any other tubule or duct. It will, of course, be understood that for purposes of simplicity all the more complicated forms of casts, such as amyloid, epithelial, fatty, and blood, will not be considered.

The term "cylindroid" is commonly used, but used in a

variety of ways, and so complicates our subject. If we eliminate cylindroids or plugs not arising from the kidney, and limit ourselves to true renal cylindroids, we are describing a body which, in many instances, conforms so closely to the pure hyaline cast that it can only be distinguished with great difficulty if at all.

Opinions as to the interpretation to be placed upon their finding vary over wide limits, but the weight of evidence is that if they have any different meaning from the pure hyaline cast it is but one of degree, and that they represent irritation, congestion, or catarrhal inflammation of the kidney, whereas the hyaline cast is supposed by some authors to represent a more serious type of inflammation.

For the purposes of this article the name "cylindroid" will be dropped and that of casts applied to all simple forms of proteid coagulation showing by their form and characteristics that they represent moulds of the renal tubules.

(Senator, 1905, "The name 'cylindroid' has been given by Thomas to a variety of coagula which, while resembling casts, are not circular or cylindric in shape, but rather like ribbons with longitudinal striations. They occur in catarrh of the urinary passages, extending into the pelvis, and in themselves, therefore, in no way indicate disease of the renal parenchyma." Purdy, 1901, "Cylindroids occur in nephritis, cystitis, renal congestion, irritation of the lower urinary tract which has in a measure extended to the kidneys. They are not characteristic of kidney disease, and may be present in urine which is free from albumin." Manges, 1893, "Not infrequently a specimen is at once cast and cylindroid, as one end of a cast terminates in a spiral, striated form. That some cylindroids are of renal origin has been positively shown; on the other hand, it is just as certain that these are found outside the kidney." von Leube, 1893, "There is no reason for specially distinguishing cylindroids from the ordinary casts." Rosenstein and Fürbringer deny the right of "attributing to cylindroids a special importance which renders their distinction from casts necessary." Thomas assumes that "cylindroids are present when the quantity of albumin is

very minute, and that they may even be the only sign of a mild nephritis." Danforth maintains that cylindroids are of great importance in the early recognition of interstitial nephritis. Manges, 1893, "If we can be absolutely sure that we are dealing with a true renal cylindroid the significance would be about the same as that of hyaline casts." Stengel, 1893, has never discovered them in urine normal in other respects. "In all diseases with which cylindroids have been associated we have reason to think there is renal irritation. If we could learn to feel that casts after all are not always an indication of serious renal mischief it would be less necessary to retain the name 'cylindroids.' ")

Frequency.—It is undoubtedly the general opinion that casts are much less frequent than renal albumin, although, as has been the case with albumin, the use of instruments of precision and a higher degree of technique have demonstrated that they are much more common than was formerly supposed. In fact, it is beginning to be appreciated that the simple forms of casts are extremely common, and that they are not limited to cases of renal disease.

(Edwards, 1897, "Casts should be searched for even when albumin is present. They are not invariable in nephritis nor are they invariably nephritic." Mitchell, 1897, "With the centrifugal machine a few casts may be found in a 24-hour urine in one out of every three examinations." Graeber, 1892, "It is generally conceded that in true renal albuminuria casts are usually found. Hyaline casts with albumin are found in transitory circulatory disturbances." Shattuck, 1894, "Renal albuminuria, as proved by the presence of both albumin and casts, is much more common in adults, quite apart from Bright's disease or any obvious source of renal irritation, than is generally supposed, this frequency increasing steadily and progressively with advancing years." Bremer, 1895, "Albuminuria without casts is an exceedingly rare occurrence." Neubauer and Vogel, "Casts are almost invariably found when the urine shows signs of albuminuria." Tobie, 1900, "Repeated examinations of urine from patients between 50 and 60, certainly far from senile, show the presence of hyaline

casts in many instances." Edwards, 1899, "Casts should be searched for as they are more commonly found than albumin." Hwass, "In 165 cases where hyaline casts were found, there was albumin in 148. In 157 cases where epithelial casts were found, there was albumin in 142. In 127 cases where granular casts were found, there was albumin in 125." Munn, "Of 137 cases of albuminuria examined microscopically, casts were found in 31, or 23%." Shattuck, 1894, reports the examination of 297 cases of all ages; in 32% no albumin nor casts were found; in 59% albumin and casts were found; in 9% albumin was found without casts. Tobie, 1900, reports 200 consecutive examinations: without albumin or casts, 109; albumin without casts, 29; albumin with casts, 35; casts without albumin, 27. Talbot-Jones, "The centrifuge has taught us that blood corpuscles and hyaline casts of the kidney are not infrequently found in normal urine." Hwass found with the centrifuge casts of various kinds in 69 out of 74 healthy soldiers, but only 61 had albumin. Tiemann, 1894, made 100 microscopical examinations and found casts in 22; with albumin, 9; without albumin, 13. Mitchell, 1895, "Among 558 patients in whom albumin was detected, casts were found in 225.")

Cause.—Discussions as to the formation of a variety of the more complicated forms of renal casts need not enter into our consideration. We should, however, consider hyaline casts as the basis of those simple forms which are of interest at this time; that granular casts may be interpreted as hyaline with granular detritus either adherent to the surface or embedded in them.

A hyaline cast represents a mould of a renal tubule made by coagulated albuminoid or proteid material. Formerly it was considered that albumin represented, of necessity, an inflammatory process, and that as the cast must mean a sufficient amount of albumin to coagulate, it was assumed that a cast must represent a higher degree of inflammation, or degeneration, than was necessary for the presence of albumin in the urine not associated with casts. It has now been established that casts are much more commonly present in the

urine than was formerly supposed, that they are present after exercise, various diets, mental excitement, etc., conditions which, while they might well be associated with renal congestion, come on so suddenly and disappear so rapidly that it could hardly be claimed that any well defined inflammation or degeneration had occurred.

(von Strumpel, 1901, "The majority of casts are without doubt produced by coagulation of albumin which transuded from the blood-vessels; in the majority of cases they form hyaline casts, in the minority they are granular." Memminger, 1899, "Tube casts are considered to be fibrinous moulds of the kidney tubules." Purdy, 1901, "With the origin of hyaline casts much difference of opinion has prevailed." Oertel contended that they were the result of secretion of the epithelial cells of the renal tubules, and in this opinion he was supported by Rovida. Bartels holds that these casts are formed by coagulation of albumin or its derivatives excreted with the urine." Graziani, 1901, "It is true there is not a constant relation between the quantity of albumin and that of the casts. It is also true that there may be cylindrical casts in the urine without being followed by nephritis." Elliott, 1896, "The presence of casts has no constant dependence on the presence of albumin. They may be absent in the presence of albuminuria, or present when no albuminuria exists." Purdy, 1901, "Numerous observers have claimed to have found hyaline casts in non-albuminous urine, but the author agrees with Bartels in that he has never met with them save in albuminous urine or urine that has lately been albuminous." Stiller, 1901, found not only albumin, but hyaline and granular casts present in diarrhoea and obstipation. Tirard, 1899, quotes a case reported by Griswold in which repeated examinations after boxing showed albumin and abundant fatty and granular casts. Nothnagel, 1894, "Casts have been found in the urine of any one with intense icterus." Mitchell, 1897, "When casts and albumin occur together, it may be assumed that the albumin is of renal origin. They may be found after exercise, cold baths, etc." McFarlane, 1894, found albumin and large numbers of casts in the urine

of football players after each game. He found large and small hyaline and granular casts, together with cells, oxalates, crystals, and blood. Penzolt, 1893, found casts in the urine of 14.6% of healthy males after exercise. He found that the ingestion of alcohol, tea, coffee, mustard, asparagus, and radishes increased their number. Craig, 1905, "But their presence [hyaline casts] can generally be explained by diet, drink, or exercise when they soon disappear. They are found in the majority of cases of persons over 50 years of age who lead a strenuous life, and quite frequently in the urine of persons who pursue an occupation demanding extreme muscular or mental fatigue. Casts in the urine show that inflammatory changes are going on in the kidney structure." Graeber, 1892, "Casts occur in ischæmia and hyperæmia of the kidneys, in circulatory disturbances, and in consecutive diseases of the vascular apparatus." Kobler, 1900, "Violent pains reflexly produce a contraction in the renal vessels which results in a diminished nutrition in the renal epithelium, this temporary disturbance permitting the excretion of transient casts." von Strumpel, 1889, "The so-called granular casts are usually nothing more than hyaline casts covered with granular masses." Skelton, 1900, "Catarrhal and hyaline casts are the basis of all other forms. The degree of irritation of the kidney, then, can be judged by a study of the nature of the casts." Smith, 1899, "Tube casts, however much they may vary in appearance, have, as their basis, albumin." Neubauer and Vogel, 1890, "The significance of urinary casts is important, due to the fact that they consist of albumin which has become coagulated.")

Prognosis.—While a great deal has been written as to the significance of renal casts, there has been, perhaps, less discussion on this topic than any other connected with the subject which we have under consideration. This is for the reason that the vast majority of all authors either assume or claim that the presence of casts in the urine is conclusive evidence of a pathologic condition somewhere in the renal tissues. It has been gradually impressing itself upon observers, since the use of the centrifuge and other instruments

of precision has become more common, that casts, especially hyaline casts, are present in a much larger number of cases than has heretofore been supposed. Some authors have gone so far as to say that casts found by the centrifuge are of no importance; others that the rare hyaline casts discovered under such conditions are so common as to need little consideration.

It is generally recognized that casts are not always found in cases of renal disease, and much has been said as to the comparative importance of casts found in albuminous urine and that which contains no albumin. It is also a matter of common knowledge that rare hyaline and granular casts, particularly when found in a urine of low specific gravity, is the condition frequently, and perhaps usually, found in chronic interstitial nephritis. The arguments against their importance when found by the centrifuge or by careful study are, to me, irrational. It is comparatively easy to diagnose an acute nephritis or a well marked parenchymatous form; and rarely would such a case pass through even a very ordinary examination without detection. It is from the interstitial form that life insurance companies are in danger, in those cases where the amount of albumin is extremely small, perhaps not detectable, where no form of cast is found except the hyaline and granular, and even they are scarce. It certainly is neither accurate nor safe for us to take the position that because casts are few we do not care to recognize them. If casts are present in the urine we should know it, as we should know all facts in order that our decisions may be reasonably accurate.

(von Strumpel, 1899, "The diagnostic significance of casts is important in that their presence always points to a kidney disease." Wagner, 1882, "The significance of casts lies in the fact that they are a constant sign of kidney disease." Senator, 1900, "The occurrence of a single cast is sufficient, in the author's opinion, to preclude the idea of a physiological albuminuria." Tyson, 1886, "However perfect may be the health of an applicant with albuminuria, the presence of casts in the urine must effectively close the gates of life insurance against him. Casts and albumin conjoined can

receive but one interpretation—structural change in the kidney." Kennedy, 1903, "The most conclusive sign that an organic lesion exists is the presence of tube casts." Senator, 1900, "In those rarer cases in which hyaline casts are found without albumin, an abnormal condition of the kidney is to be assumed." Senator, 1895, "Casts are always a sign of pathological changes in the kidney, especially in the epithelium from the simplest disturbance of function and nutrition to the complete destruction of the parenchyma." von Leube, 1887, "If the sediment of an apparently normal urine on microscopical examination shows several hyaline casts, it is a pathologic condition." Senator, 1905, "Hyaline casts unquestionably occur in conditions in which there is not the faintest sign of inflammation." Linsley, 1899, "The least significance of these casts [hyaline] is a renal irritation." Purdy, 1901, "The disposition to regard hyaline casts of the small narrow order as of no serious import is a mistake of the gravest character, for indeed they are often chief evidence of the existence of a most serious form of renal disease." Symonds, 1898, "The presence of tube casts is usually looked upon as indicative of an organic renal trouble, and still some authors have reported casts in cases which they regard as of functional origin, and Koessel has undertaken to prove that casts are perfectly innocuous at times. In spite of these attempts we, in life insurance, welcome them as cheerfully as we would a rattlesnake." Mitchell, 1895, "Of 558 urines in which albumin was found, 304 had casts. Of the 304, 30% died, while of the remaining 254, 14% died. The mortality of casts and albumin is three times as great as the non-albuminuric, and more than twice as great as those who had albumin without casts." Lee, 1900, "The diagnosis of functional albuminuria must be made only after long observation. Casts must be absent or present in very small quantities, with no other sign of renal disease." Craig, 1905, "When albuminuria accompanies casts, the significance of the latter is always of more serious import." Charles, 1891, "Those cases are suspicious where there are tube casts other than hyaline, for while the absence of casts

does not imply the absence of renal disease, their presence is always suspicious." Porter, 1887, "A single cast of the hyaline variety may be found in the urine without indication of any renal lesion, but their continuance in any appreciable number is always an indication of some retrograde change. The fine granular cast represents still greater destructive change." Mitchell, 1897, "Albuminuria and a few hyaline casts at intervals signify a mild circulatory disturbance of the kidney." Spaeth, 1897, "Only the so-called hyaline casts, which may be found in the urinary tubules during perfect intactness of the renal epithelium and may occur without albumin being demonstrated, may now and then occur singly in normal urine." Kelley, 1902, "The importance and significance of albuminuria are always much enhanced by the associated presence of casts, but still it has to be borne in mind that both albumin and casts may be present without serious disease of the kidneys." Kuttner, 1902, in connection with cyclic albuminuria says, "In cases which show hyaline casts in abundance and repeatedly, an increased disturbance in circulation, or even irritation of the kidney, must be assumed." Barrs, 1899, "Tube casts, to be of serious import, must be in considerable quantity, of considerable size, and more or less constantly present." Smith, 1899, "All forms, except possibly the hyaline, show serious disturbance of the kidney, the degree depending upon the character, and it may be number, of the casts." Pribram, 1904, "It is now generally acknowledged that the finding of granular and epithelial casts points to a diseased condition of the texture of the kidneys. The finding of these casts in cases of cyclists and after cold baths leads us to suspect transitory changes of the kidneys." Saundby, 1889, "Slender hyaline casts are evidence only of a mild inflammatory process which may be the result of transient irritation." McCollom, 1898, "Frequently, isolated casts, a condition which is conclusive of an injury to the extent that albumin has coagulated in the uriniferous tubules." Vanderpoel, 1893, "Usually the discovery of casts is of great diagnostic and prognostic importance, but hyaline, epithelial, and fine granular casts have been found in

cases which eventually completely recovered and may at the time have appeared in perfect health in every other way." Purdy, 1901, "In so-called physiological albuminuria the urine contains no renal casts or very few perfectly hyaline ones." Saundby, 1888, "If one or two slender hyaline casts appear, I do not condemn the kidneys." Wesener, 1899, "A few hyaline casts with normal specific gravity do not necessarily mean kidney disease." Washburn, 1893, "It being easily conceivable that these substances [crystals] may initiate such a condition as to give rise to casts, such condition being but transitory, the tubules returning promptly to their normal state." Neubauer and Vogel, 1890, "The absence of red cells and fresh hyaline casts point to anæmia, the presence of numbers of them, to hyperæmia of the kidneys." Grainger Stewart observed sudden and copious occurrences of albumin with numerous casts, the process lasting only a short time and recurring at intervals. He has never known them to prove permanently injurious. Johnson, 1899, "Small hyaline and epithelial casts are often present in the albuminous urine of patients whose speedy recovery may confidently be expected." Lambert, "I am confident that the presence of an occasional cast does not necessarily imply destruction or permanent disease of the kidneys." Cole, 1896, "The occasional presence of a few hyaline casts is no cause for great alarm." Kobbler, 1900, "Numerous hyaline and fine granular casts may occur without incurring irreparable disturbance of the anatomical renal elements." Shattuck, 1894, "Anxiety is not awakened, either for the present or the future, when a faint trace of albumin with hyaline and finely granular casts of small diameter are found in the urine of a patient after the age of 50, provided the kidneys are doing sufficient work and there are no symptoms." Allchin, "Casts afford practical information, rarely, if ever, conclusive when taken alone." Bedford, 1904, "The presence of casts does not afford certain proof of renal disease." Long, 1900, "Hyaline casts do not necessarily indicate kidney disease." Mitchell, 1891, "A few small hyaline casts occasionally found, especially after violent exercise, are not ominous." Janeway mentions a case in which the urine

contained casts after boxing, and speaks of Weston (the pedestrian) who, after extraordinary feats, showed both hyaline and granular casts which vanished as quickly as they came after a night's rest. He says it follows that hyaline casts may appear in the urine, quickly form and quickly go. Tirard, 1899, "They [hyaline casts] may be present in any congestive condition of the kidney. They may indicate the slightest form of renal irritation. They are occasionally seen in dietetic forms of albuminuria as well as with lithuria and oxaluria. They have also been described in connection with prolonged muscular exertion. Delicate hyaline casts may sometimes be met with in a so-called physiological albuminuria or that of adolescence, conditions possibly dependent on circulatory abnormalities." Saundby, "In one or two cases there were a few hyaline casts; as we know, they are of no pathologic significance." Defendorf, 1902, "Purely hyaline casts may be found in large percentages of individuals who are apparently healthy without other evidence of kidney disease. These percentages increase with advancing age." Rosenstein, 1894, "Hyaline casts may be found in normal urine." Memminger, 1899, "Casts after middle life are often but the expression of natural and not serious pathologic changes going on in the kidneys." Runeberg, 1902, "These casts go to show that albumin has transuded through some at least of the urinary tubules; they may therefore occur wherever albumin is present or has recently existed." Craig, 1905, "The presence of a hyaline cast in the urine is not an infallible sign of kidney disease; they are frequently found in the urine of healthy persons." Tuttle, 1899, "By careful search, casts may be found in the urine of persons in perfect health." Stone, 1898, "Time was when casts were considered of great diagnostic value; the centrifuge shows that single casts may be found in almost every urine." Shattuck, "Hyaline and granular casts are the rule rather than the exception after middle life. I am always skeptical when albumin of renal origin is reported without formed elements and casts." Greene, 1905, "Hyaline casts represent the least degree of pathologic inflammatory change. It may

even be considered an open question whether hyaline casts obtained by the centrifuge, unless present in considerable numbers, are to be considered abnormal." Shattuck, "These bodies still enjoy a worse reputation in the minds of the laity than albumin, as well as in the minds of the profession in general. The frequency with which albumin and casts, chiefly hyaline and finely granular of small diameter, were reported in those at or beyond middle life, entirely apart from any other evidence of renal mischief, attracted my attention." Talbot-Jones, 1900, "In members of a bicycle club, tube casts of all kinds were found in all but two, and more or less albumin in all." Edes, "A few casts may accompany a very slight amount of albumin and have no meaning." Goldstein, 1894, "A few hyaline casts have no particular significance if other conditions of the urine are normal." Coisceau, 1897, "Casts have less importance than was at first believed. Hyaline casts have no precise significance." Tobie, 1900, "I believe that life insurance companies will yet issue endowment policies knowingly to applicants whose urine contains casts, even as they have done so many years unknowingly." Memminger, 1899, does not regard, after middle life, the occasional finding of tube casts, hyaline and sometimes granular, as militating against insurance, if the relative absolutes are normal and the urine free from albumin.

In order that we might apply the standard test which has been suggested to the urine after exercise, the urines of the baseball team of our company were examined in our laboratory before and after an ordinary game. These were young men and all apparently in good health, in fact we have every reason to believe that each one would pass the ordinary, or even an expert, examination for insurance. Of the nine men, all showed a normal urine before the game with two exceptions, both messengers, and both had spent most of the morning at their regular routine work in quite active exercise. Immediately after the game, in every case there were present albumin, and casts in all but one, the amounts varying from the slightest possible trace to a large trace, the latter occurring in three cases, the slightest possible trace in two. In one

of these, the specific gravity before the game was 1013 and normal in every other way, after the game it was 1011½, and this individual was the only one who did not show the presence of casts. The samples for the first examination were passed in the dressing-room immediately before the preliminary practice, those for the second examination were passed in the dressing-room immediately after the game.

Here, then, we have nine healthy, young men, two of whom, after a morning of moderately heavy exercise, present albumin and casts; after the game, each one of the nine has albumin, and all but one, casts. It is also an interesting fact that of the four presenting the largest amount—that is, a large trace—three occupied positions involving the greatest amount of exercise, that of pitcher, catcher, and shortstop, while the other had a specific gravity of 1030 both before and after the game and therefore might be expected to show a considerable amount.

Based entirely on the information furnished us in literature, we are justified in assuming that hyaline and finely granular casts do not of themselves demonstrate the presence of organic disease of the kidney; that they are very much more common than has ordinarily been supposed; that in normal individuals they commonly follow conditions to which we are many of us exposed every day, such as modifications in diet, the passage of irritating substances (crystals) through the kidney, moderate exercise, mental strain—in fact, any condition which causes an increase in the amount of blood in the kidneys. It should be here noted that these causes are exactly the same ones that are responsible for albuminuria.

One can hardly read the evidence here furnished without being satisfied that casts are frequently found under very ordinary conditions, and that the percentage in which they are found varies materially with different observers.

In order that we should have some ground upon which to stand, I have investigated a group of cases which have been submitted to the standard examination—that is, the expert one. In so doing, I have considered the last 600 cases examined in our laboratory under good conditions, in which renal

albuminuria was apparently found. In this group I have included as renal all those cases which did not show some evidence that the albumin found depended upon some condition in the genito-urinary tract outside of the kidneys, and by this method have undoubtedly included a few cases under the head of renal where the source of the albumin was lower down. In these 600 cases of so-called renal albuminuria, hyaline and finely granular casts were detected in 93.8%. As it is fair to assume that some of these albuminurias were not of renal origin, so it is equally sure that the percentage in which casts would be found by such an examination in strictly renal albuminuria would be somewhat higher.

Out of the same group of cases, in 96% of those showing renal casts albuminuria was detected, and as renal casts are in themselves albuminous, the other 4% might be called a margin of error, or a margin in which the test as applied was not sufficiently delicate to detect the albumin. It seems to me that as we know there must be albumin to some extent in all cases which present renal casts, so we are justified in the assumption that in all cases where the albumin is of renal origin, casts might be found if the search for them was sufficiently prolonged and sufficiently accurate.

If this is the fact, and I believe the supposition is justified, the interpretation which should be placed upon the finding of a true renal hyaline cast is that the albumin in the urine, or at least part of it, is of renal origin, and this position I take.

If this interpretation of the finding of the simplest forms of casts is accepted, the same interpretation must be placed upon the presence of finely granular casts which, as has been stated, are found frequently after ordinary conditions, and consist of hyaline casts on the surface or in the substance of which are imbedded small particles of granular detritus. It has been clearly demonstrated that crystals, particularly those of oxalate of lime, epithelial cells from the renal tubules, and blood cells are frequently and commonly found after similar conditions. In a number of classes which have been reported, hyaline casts to which have been attached crystals, cells, or blood have also been found after similar conditions, and in

a few groups where the exercise has been excessive, as after long-distance walking or running, football playing, boxing, and rowing, very large amounts of albumin, together with large numbers of granular, epithelial, crystalline, and blood casts, have been detected.

A fairly good example of this last group is that of a case which I have had followed for two weeks, a young man who had recently passed an examination for insurance which, so far as his family and personal histories and physical condition went, justified the issuance of the largest amount of insurance granted by any company. He was apparently, and to the best of my knowledge, an ideal risk for insurance and his urine was examined twice each day for that period of time. The examinations were made in summer and the specific gravity varied from 1027 to 1030. Twice during the first four days there was a considerable amount of oxalate of lime in the sediment, otherwise the urines were normal. On Saturday afternoon he pitched a game of baseball. The urine passed at 11 P. M. after the game showed a trace of albumin, considerable blood, some renal cells, a little fibrin, numerous hyaline and granular casts, many with blood corpuscles and renal cells adherent, and much oxalate of lime. On Monday morning the urine was entirely normal and continued so throughout the week until the following Saturday, when after another game of baseball the same conditions were found. One year later the same man played another game of ball. Before the game the specific gravity was 1017, there was no albumin or sugar and the sediment was entirely normal. After the game the specific gravity was 1013, a large trace of albumin was found, and a microscopical examination showed occasional oxalate of lime crystals, occasional leucocytes, an excess of squamous and renal epithelium, and fairly numerous hyaline and granular casts with renal cells adherent. This young man is now in perfect health, and an examination of urine some five months after the last one reported is entirely normal.

I believe, then, that we are justified in answering the question implied by the title of this paper—that is, The

Significance of Albumin and Casts when Found in the Urine of Apparently Healthy Applicants for Life Insurance, by saying:

That the finding of a hyaline or finely granular cast means that the albumin, or a part of it, is of renal origin, and that this is all it means.

That the significance of albumin in the urine is purely symptomatic—in other words, that albumin and hyaline casts are a symptom of renal irritation or congestion, not necessarily to any extreme or even considerable degree.

That they are so commonly found as to justify us in saying that they are among the most common of all symptoms, and that we should no more base our decision upon the finding of albumin and casts in the urine than we should upon the finding of any other symptom.

That it is our duty to ascertain, if possible, the cause of that symptom, and as to whether or not that cause is one which influences the expectation of life.

While not directly following the title of this paper, it may be of some interest to consider for a moment methods which might be of value in making such a decision. Circulatory changes in the kidney, and undoubtedly we must have circulatory changes in the kidney to account for albumin and casts in the urine, depend, in a general way, upon the conditions of three great systems,—the urinary, the circulatory, and the nervous. Any irritant excreted through the kidney may be sufficient to cause an irritation and so a congestion of the kidney itself. Anything involving the circulatory apparatus, which interferes with the flow of blood through the kidney or increases the flow into it, may cause a congestion, either passive or active, of that organ. Anything which affects the nervous system in such a way as to cause local dilatation of the blood-vessels, or which acts upon the kidney secondarily through the circulatory apparatus, may cause a congestion of the kidney. Anything which causes a congestion of the kidney may, and in all human probability will, be followed by the presence of albumin and casts in the urine, detectable on expert examination. There is no organ in the body which is so susceptible to expert examination as is

the kidney. Not only is it palpable, but its excretion is so large in amount and so easily obtained that it may be subjected to the most careful and accurate chemical examination. There is probably no organ, the action of which is so easy to follow as the kidney, and from the information at our hands it would appear that a very accurate idea of its functioning power may be obtained from chemical examination of the urine.

It is generally recognized that the relative proportion and variety of certain solids in the urine give a very accurate idea as to the condition of the kidney excreting that urine. It is generally recognized that a low specific gravity with low percentages of solids, particularly urea, and phosphoric acid in its combinations, shows very satisfactorily whether or not that kidney is doing its work. It is generally recognized that a normal specific gravity and a decrease in the relative proportion of these two substances is very suggestive, if not positive evidence, that the kidneys themselves are not effective.

Specific Gravity.—Washburn, 1893, "The specific gravity of the urine is regarded by some as one of the most diagnostic indications we have." Saundby has shown that in 70% of structural disease of the kidneys the amount of urine is increased, the specific gravity being correspondingly low; hence, other things being equal, a specific gravity of 1020 or above of the total daily urine would strengthen the opinion that no grave kidney disease existed." Wesener, in 1899, reported that 40% of all urines examined in his laboratory which had a specific gravity below 1015 were pathological. Memminger, in 1899, said, "Albumin when found in a urine habitually with diminished specific gravity is an unfailing evidence of disease of the kidneys." Whittaker, in 1897, said, "If I had to rely on any one factor, I would take the specific gravity; a light urine is always suspicious." Harley says, "The specific gravity of the urine is a far more reliable guide to prognosis than either the quantity of albumin or the tube casts." Tyson, in 1888, says, "To judge unfavorably from the specific gravity of any portion of the 24-hour urine would be exceedingly unfair to the candidate."

Urea.—Purdy in 1901, "The examination of the urine can scarcely be considered complete which does not include an estimate of the quantity of its contained urea. If the gross quantity of urea sinks, there is reason to apprehend the presence of organic disease of the kidneys. On the other hand, a normal amount of urea with an absence of albumin strongly indicates that the kidneys are healthy." Wesener, 1899, "The normal amount varies during the 24 hours between 2 and 3%. Out of 741 apparently normal urines, 53.3% contained the normal amount of urea." Freitag, in 1898, places the excretion at from 2.5% to 3.2%, with the normal limit of specific gravity from 1015 to 1025. Cammerer, in 1888, considers that in summer the specific gravity should be about 1025 with about 3% of urea, while in winter a specific gravity of 1030 should have urea of 2.5%. It is generally recognized that the amount of urea varies with different conditions, including the ingestion of food and the increase or diminution of metabolism, and Rem Picci, in 1902, states that all the solid constituents of the urine are increased after cold baths, regardless of whether albumin is present or not. It is also generally recognized that diminution in the actual output of urea is strongly suggestive of organic disease, and that if this diminution is persistent it is practically conclusive. von Baum 1894, "If there is a functional type of albuminuria the urea should remain normal; the moment the daily excretion of urea is diminished, renal disease is existing or impending." Washburn, 1893, "A diminished average in the daily excretion of urea is one of the earliest indications pointing to nephritis." Gordon, 1902, "A decrease in the amount of urea is the most important sign in connection with renal disease." Coisceau, 1897, "The normal quantity of urea is from 25 to 30 grams. In an adult whose quantity of urine is very small, and whose urea has fallen to 18 or 19 grams, with a specific gravity of 1020, the danger is not on the side of the albumin, but in the small quantity of urea excreted." Brown, 1891, "In cases of abuminuria of doubtful origin, if the individual is excreting from 20 to 30 grams of urea daily it is evident that the urinary tubules are not affected."

Phosphates.—It is generally recognized that an increase in the amount of phosphates, so-called phosphaturia, is, in the majority of cases, a symptom of hysteria and neurasthenia, or excessive mental or nervous effort or strain. Klotz, 1894, "In many cases phosphaturia is a symptom of neurasthenia or hysteria, and is observed in students during examination, as it is in cases of great mental exertion." Loether, 1902, states, that in almost all cases of phosphaturia dyspeptic symptoms are present. It is generally conceded that a diminished percentage of phosphoric acid or phosphates represents a very similar condition to that shown by a diminution in the urea, and that as a suggestion of chronic renal disease it is equally important. Neubauer and Vogel, 1890, "Phosphoric acid is diminished in acute Bright's and in amyloid degeneration." Purdy, in 1901, regards the diminution of phosphoric acid excretion by the kidneys as almost as constant a factor of the urine in Bright's disease and allied lesions of the kidneys as is the presence of albumin, and states that in chronic interstitial nephritis the phosphates are invariably reduced both relatively and absolutely, and that the urea may suffer a slight reduction or may remain normal until later. Mitchell, 1897, in speaking of albuminuria says, "When the quantity of phosphoric acid falls below 2 grams the chances are great that the albumin is of renal origin, and when it falls below 1.5 grams the probabilities of rapidly fatal renal disease are greater than those of recovery." Butler, 1894, "A decreased elimination of phosphoric acid has been observed in various forms of nephritis, acute and chronic rheumatism, Addison's disease, hysteria, and blood poisoning, while it is increased in wasting diseases, leukæmia and severe anæmia."

Chlorides.—There does not seem to have been so much attention paid to the comparative importance of the elimination of chlorides as there has been to the other solids, and the importance of the percentage is not as generally conceded, it being regarded that the varying ingestion of chloride sodium between different individuals and the same individuals on different days controls, to a considerable extent, its relative amount. Sonal, 1900, states that the urine of syphilitics is

commonly normal with the exception of the chlorides, which are always increased. Memminger, 1899, "The quantity of chloride present is between 12 and 13 grams in 24 hours; when the average falls much below these figures it is a sign of disease of the kidneys." Neubauer and Vogel, "Chlorides are diminished in all acute or chronic diseases of the kidneys which are accompanied by albuminuria."

It is, of course, appreciated that all these statements refer to the percentages of solids found in the 24 hours' amount of urine, and in applying these facts to the work of life insurance the accuracy of Tyson's statement that it would be unfair to the applicant to arrive at a decision based upon the examination of any portion of the 24-hour amount should be kept in mind. At the same time, for purposes of life insurance it is rarely possible to obtain the 24-hour amount of urine, or at least to guarantee the authenticity of such a specimen.

For the past two years we have been acting upon the principles suggested above, that albumin and casts in the urine were a symptom of disturbance, either in the urinary, circulatory, or nervous system; that if we could be satisfied that these systems were normal we were justified in accepting an applicant whether or not, at some time in the past, he had shown albumin and casts in the urine.

Samples of such urine, have been submitted to expert examination, and if the urine was positively normal as shown by such an examination, and if the circulatory and nervous systems were normal, as shown by careful examination, we have accepted the risk.

During this time we have accepted 785 risks of this class. Assuming their age at entry to be 35 years,—and I am sure that it was much above this,—according to the American Experience Table we should have expected a mortality of 6.8%.

One of these risks has died up to this time, and he was blown up by an automobile.

The following paper was then read by Dr. Thomas C. Craig:

ALBUMINURIA.

The subject of albuminuria is always an interesting one to the medical man, surrounded as it is with so many doubts and possibilities.

The causes of albuminuria are many, but it might be more exact to say that the reason we occasionally find albumin in the urine is because there are certain factors in operation which produce a relaxation or a high vascular tension, or an irritation of the renal tissues, and these in their turn are accompanied by a transudation of the albuminous elements of the blood into the urine. Certain it is that many cases of albuminuria are brought about by an irritation of the renal tissues, or an inflammatory condition, and this may be of a high or a low-grade intensity, which results in either a large amount of outpouring of serum, or a medium or a small amount of outpouring of this serum.

Albumin is not the disease, but is only a symptom of a disorder in some portion of the genito-urinary tract. The albumin may be temporary, or it may be permanent, but this will depend on whether the cause is continuous or not. No albuminuria should be lightly regarded, and no pains should be spared in trying to solve its origin and to correct or remove the cause. Failing to remove the cause, we should try and limit its further advance, and thus prolong the patient's life as much as possible.

Systematic writers describe albuminuria under two divisions: renal albuminuria, or that which comes from the renal tissue proper, also known as true albuminuria; and extra renal albuminuria, or that which originates on the distal side of the kidneys, sometimes called false albuminuria, or extra renal albuminuria. From a prognostic and diagnostic standpoint it is very essential that we be able to distinguish between these two sources of albumin. First, as to renal or true albuminuria. The kidneys are compound tubular glands, and it may not be amiss to glance at the anatomy of the renal circulation so that we can keep in mind its intricate capillary network. The renal arteries entering the kidney divide at

the junction of the medullary and cortical portions, sending separate branches to each part; the branch which goes to the renal glomeruli giving off numerous capillaries which are held together by a connective-tissue stroma and united into groups or lobules. Each renal glomerulus is supplied by an afferent artery which pierces Bowman's capsule and breaks up into a system of capillary vessels which anastomose, forming a capillary tuft, and like all capillary vessels gradually ends in an efferent vessel which leaves the glomerulus by the side of the afferent vessel. This afferent vessel again forms a capillary plexus which surrounds the convolutions of the urinary tubules and gradually forms the returning venous vessels.

The first system of vessels is entirely concerned with the glomerular circulation. The other vessels given off from the renal artery pass into the medullary portion of the kidney and forming a network of capillaries dip down among and between the uriniferous tubules of the pyramids and anastomosing form a network of vessels over these tubules, and finally uniting, one with the other, form a return vein which empties into the renal vein—this latter set of vessels is called the vasa recta. Thus, we see, that there are three different sets of capillary vessels in the kidney, each one surrounding a different part of the renal tubule, and each one evidently intended for a different physiological function. In the normal state, the action of these capillaries is controlled by the vasomotor nerves, and the excretion of the watery and soluble matters of the blood goes on in a physiological manner; but under pathological conditions, the action of these vasomotor nerves is disturbed, and we find them losing their controlling power to act in the normal way, and, as a consequence, we find abnormal substances appearing in the urine. It has always seemed to me that the cells which are most at fault in an albuminuria are the endothelial cells lining the capillaries, and not so much the cells lining the glomerulus or the uriniferous tubules. It is the endothelial cells lining the capillaries which are first affected by the irritating material circulating in the blood-vessels, and they become weakened in their resistive power to retain the albuminous part of the

blood. This loss of control takes place in the renal capillaries just as it does in any other capillary network or tissue. For example, an injury to, or an irritant in contact with, the skin will produce an outflow of the blood serum. Toxines circulating in the blood often produce vesiculation of the skin and the appearance of an albuminous fluid. The skin and kidneys are analogous and act in reciprocal conjunction, one with the other.

The perspiratory glands with their ducts are analogues of the malpighian tufts with their tubules. We are all familiar with the reciprocal action of the skin and kidneys in warm and in cold weather. The action of the cells lining the uriniferous tubules and the glomeruli is always one of excretion, or the abstracting of any and all soluble substances from the blood; while they are in a healthy condition their inherent power as glandular tissue is to excrete.

This brings us now to inquire what are the causes or substances which so cripple or disorganize the renal-tissue cells as to render them ineffective to retain the albumin of the blood. The answer can be made that it is any substance which by contact with them lowers their vital resistance. It matters very little what these substances are; it is their effect on these tissues that concerns us. A vast array of substances has been noted as capable of causing the appearance of albumin in the urine; common among these are foods, medicines, toxines, alcohol, spices, etc.; it should be remembered that it is not the actual entity itself, but the **amount and quality of irritating material absorbed into the blood and subsequently excreted by the kidneys that produce the effect.** We are also told that cold bathing, undue exercise, and severe mental impressions, assuming the upright position, high altitudes, etc., will at times produce albumin in the urine, but in these latter causes it is probably due to capillary relaxation or over-distension which, for the time being, causes capillary relaxation that brings about the escape of minute quantities of albumin into the urine, or, as has been suggested, a capillary renal tire or functional temporary cell exhaustion due to overfilling of the vessels that is responsible for this

form of non-toxic and non-inflammatory albuminuria. Notwithstanding the many different varieties of albuminuria described in the text-books, there are only two kinds which concern the physician, viz., *temporary albuminuria* and *constant albuminuria*. Of course the amount of albumin found to be present in either of these conditions may vary within wide limits, from the most minute trace to an almost solid mass.

Temporary albuminuria is quite common in the earlier years of life; so much so is this that we are never alarmed at the trace of albumin found in youth. Experience has taught us that it almost invariably ceases in a short time; and entirely does so in all cases where the cause can be ascertained and removed. Albuminuria in the young is seldom accompanied by the presence of renal-tube casts; so nearly is this the rule that when we do find casts we always regard the case with grave suspicion and sedulously watch its course. The very opposite of this portends in the middle aged and old. In these cases we expect to find the small and medium-sized clear hyaline casts as a general rule; and when albumin makes its appearance, we at once become suspicious that some inflammatory trouble has commenced, and we carefully watch the case to ascertain whether the albumin is temporary or constant in its presence. In the young the renal epithelia are the same in resistive power as the other epithelia, viz., easily injured, quick to show the effects of damage. In proof of this I have only to mention the tender mucous lining of the respiratory and alimentary tracts, and the vulnerability of them; as shown by the hæmoptysis of adolescence, the nosebleed of childhood, the alimentary disturbances in children, and in early age. These delicate epithelial linings are easily injured. They are extremely sensitive to irritants and they quickly respond to all forms of toxins and poisonous by-products, hence it has occurred to me that the cardinal reason why albuminuria is so easily provoked and so temporary in the early period of life, lies in the fact that the epithelial cells are weak and unable to resist, and that the neuro-epithelial control is readily disarranged by very trivial departures from the physiological

standard. On the other hand these epithelial cells quickly regain their lost function as soon as the irritant cause is removed or subsides.

In middle life and old age, we have the opposite condition. Then the epithelial cells are more tough, more resistant. It takes a much stronger and a more prolonged contact of any irritant to affect them. Toxins and by-products, which in youth would quickly call forth an albuminuria, in middle life and advanced age are often borne with no evidence of any ill effect on the renal tissues. The resistive power of these tissues has been increased with the advance in years. The change from youth to old age is conveniently divided into four periods, and these four periods represent a gradual lessening of the number of cases of albuminuria up to a certain age, and then a gradual reappearance in the number of them. The periods are as follows: from the age of 15 years to 30 years albuminuria is comparatively common, in the vast majority of cases of no serious moment, seldom accompanied by the presence of tube casts, and is quickly recovered from. The second period is from 30 years to 45 years. In these years the person has reached his full and mature development; the epithelial cells are vigorous and resistant and the appearance of albumin is not often encountered; when it is found, there is nearly always discovered a cause for it; reconstruction of damaged tissue is prompt, repair is complete, and health is gradually restored in many cases. The appearance of albumin in this period is often due to errors in diet, prolonged and strenuous work thrown on the tissues, the too free use of alcoholic liquors to stimulate an overworked body, want of rest to the body tissues, and, in some of these cases, the cause not being removed, the albuminuria becomes a permanent factor and the body tissues gradually drift into the development of one of the varieties of nephritis. We are more prone to hold on to and continue unhygienic habits and conditions in this period than we are in the earlier period, hence it is, that in this period more cases of nephritis have their commencement than in the earlier period. In the third period, viz., from 45 to 60 years the

tissues are still resistant to the less irritating toxins and by-products, but it is in this period that all of the body tissues begin to lose their natural vigor, and to be more apt to succumb to external agencies that in the second period were recovered from. It is also in this period that we see the effects of overwork and overeating and drinking which lay the foundations for tissue degeneration, and it is also in this period that we begin to see the resistive power of the tissues gradually lose their inherent power. Cases of albuminuria are more frequent than in the second period, and it is a well-known fact that fewer of them recover from the trouble than in the preceding two periods. The fourth period is from the age of 60 to 75 years, or until death. This is the period of decline. The person has now arrived at the time of life when the degeneration of the tissues begins in true earnest. All of the cell tissues are easily affected by external and by internal conditions. The vital forces seem to recede from their accustomed standard and to approach the easily injured state of early youth. This is especially true of the renal tissues, and it is at this period that urinary tube casts are very common; arterio-sclerosis is frequently met with, and albuminuria is more common than at any other period of life. This is the period in which it is very common to find the fully developed interstitial nephritis, now passed far beyond any hope of cure or arrest. Albuminuria is always serious in this period, and it is present in a large percentage of these persons. It is always only a question of time as to how long the weakened arteries will withstand final rupture, or the slowly developing dropsy will finally drown the person in his own tissues.

Any substance that is absorbed into the blood and in its passage out through the kidneys causes an irritation of sufficient intensity to impair the vital resisting power of the endothelial and renal tissues will produce an albuminuria. This is exemplified in such diseases as produce toxins—and these in many instances so disorganize the vitality of the endothelial and renal tissues as to produce the appearance of albumin in the urine. This is not seen in all cases, for the

toxin is more irritating in some attacks than in others; yet the rule is for us to expect to find albumin in the majority of these cases. Stasis of the renal circulation or even the retardation of the blood flow will cause an albuminuria in many cases. A weakened cardiac power, a leakage of the mitral valve, a stenosis of the mitral orifice, or a tumor pressing on the lower vena cava, or a torsion of the renal vessels or ureter, or renal calculi, or tumor, will either or all produce an albuminuria in many cases. The renal circulation goes on normally as long as the relative proportion, size, and amount of stroma and cells remain normal, but if from any cause there is a loss of this physiological balance, then we begin to have renal stasis or congestion, either one of which will produce an albuminuria. Irritating materials circulating in the blood cause increased growth of the connective-tissue stroma or framework in many of the organs; thickening of the blood-vessel coats, thus narrowing the capacity of these vessels; as a consequence the nutrition of these tissues is inhibited; various salts are deposited in their walls and we have the condition established known as arterio-sclerosis. The heart hypertrophies and thereby becomes more powerful, and we thus have a more strongly acting heart, forcing an irritating laden blood stream into vessels of smaller calibre, and as a result a cyanotic congestion results, which in time gives rise to an albuminuria. Poisonous food products as seen in dyspeptic condition and an over-supply of food products, the absorption of lead, many remedial agents, the toxin of syphilis, in its later forms, the toxins from sup-puration, the ingestion of alcohol, and many other things will in many cases produce an irritation of the renal structures sufficient to call forth an albuminuria.

We meet albuminuria, as a rule, in many diseases; the following are some of the more common ones in which it is generally seen:

- Simple pyrexia,
- Acute and passive renal hyperæmia,
- Acute parenchymatous nephritis,

Chronic parenchymatous nephritis,
Chronic interstitial nephritis,
Suppurative interstitial nephritis, or, as it is commonly
called, surgical kidney,
Amyloid degeneration of the kidneys,
Cystic disease of the kidneys,
Renal tuberculosis,
Renal cancer,
Renal calculus,
Renal hæmorrhage,
Uræmia.

Diseases accompanied by a pyrexial condition, such as :

Typhoid fever,
Diphtheria,
Scarlet fever,
Cholera,
Yellow fever,
Small-pox
Pneumonia,
Pulmonary tuberculosis,
Acute rheumatism,
Acute and chronic gout,
Erysipelas,
Grippe.

Then again, we expect to find albumin in the urine in those affections which involve the urinary tissues on the distal side of the kidneys, or extra renal, as it is called. The most common of these are: pyelitis, from whatever cause, inflammation or disease of the ureter, cystitis, acute and chronic, and all inflammatory bladder troubles. Diseases of the prostate gland and inflammatory diseases of the vesiculæ seminales, urethritis and all inflammatory conditions of the urethra, whether due to disease or to surgical traumatism, stricture of the urethra, pressure on the renal veins during pregnancy or pressure on them by tumors lead to a renal congestion; so likewise, may a loose kidney twist the vessels or the ureter to such an extent as to bring about a congestion,

and thus these causes may lead to an extra-renal albuminuria. Renal congestion and renal inflammatory trouble may not involve both kidneys, but only one of them, especially is this true in cases of pyonephrosis, renal cancer, renal tuberculosis, pyelonephrosis, and renal calculus. Furthermore, the renal tissue of the affected kidney may not be wholly involved but the disease may be present only in a portion of the organ. In order to determine whether one or both organs are affected, it sometimes becomes necessary to collect the renal secretion separately from each organ by means of catheterizing each ureter, and carefully labelling the specimens, marking them respectively, sample from right and sample from left kidney. We must not overlook the fact that admixture of a vaginal discharge or menstrual flow may produce the presence of albumin in the urine, and it should always be our aim to prevent any admixture from these sources. When we cannot be positive that these sources of contamination are excluded, then the specimen of urine should be procured by catheterization. It may even be necessary to wash out the bladder or urethra before collecting a specimen. In our earlier teachings we always insisted on a morning sample of urine for examination. At present we know that it is not the early morning sample which gives us the best results of the renal lesion, but it is a late afternoon or evening sample, after the wear and tear of the day's toil, which will give us more correct and more true information than the morning sample. It is still better to collect and thoroughly mix and measure a full 24-hour sample; we will then be more positive of our results; and further, the sample will show us the full working power of the kidneys, besides any estimation of the solids will be more satisfactory. I think that one reason why albumin is sometimes overlooked in our search for it lies in the fact that we try to find it under unfavorable conditions. The specimen may be cloudy from pus, blood, bacteria, or the falling out of solution of the more insoluble urinary salts. Whatever the cause may be, it should be removed. Filtration through several thicknesses of paper will remove most of the causes of turbidity, but it will not always remove the

bacteria. The books tell us that the bacterial turbidity may be removed by shaking the urine with powdered talcum or heavy calcined magnesia and then filtering. This will remove the bacteria, but it will also convert a certain amount of the albumin, or perhaps all of it, into alkali albumin, or remove it entirely from the urine. All tests are then of no avail to detect the albumin, for we will not get any reaction. This is particularly unfortunate where the amount of albumin is very small in quantity, for it often happens that the whole of the albumin is changed into alkali albumin, or removed entirely, and our tests give negative results. I have often tried this and speak from experience. Dr. Symonds of the Mutual Life has called attention to this fact in his late work on life-insurance examinations, and it is the only place I have ever seen the fact recorded in print. When we get a turbid specimen we should filter and refilter and get the specimen as clear as possible. No matter how clear a specimen looks, we should filter it. Never examine a specimen for albumin by the aid of artificial light. If forced to examine by artificial light and you get a positive result, well and good; but if the result is negative, never base an opinion on the result of a test unless made in *bright daylight*. Where small amounts of albumin are sought for, the most trustworthy results are obtained by examining the sample in the early forenoon or late afternoon when the sun is so low down in the sky that its light can be transmitted through the specimen. By this sunlight and a black background, we obtain the best results. Albumin indicates an inflammatory condition and accordingly as the intensity of the inflammation varies will the amount of albumin be. The inflammation may be intermittent and as a consequence, we will have an intermittent albuminuria. According to the constancy of the inflammatory condition will be the persistency of the albuminuria. Thus our results may show a temporary presence of albumin, or on the other hand the cause of the trouble may be constant, and we will then have a permanent albuminuria. It is on this temporary or permanent presence of albumin that our diagnosis and prognosis will have to depend. If the cause of

the albuminuria cannot be removed the condition will become chronic. The amount of albumin found on examination is not always an index of the gravity of the case, for there are other symptoms which must be looked for; the principal ones are whether renal-tube casts accompany the albumin, the condition of the heart, whether hypertrophied or not, whether valvular disease exists or not, whether the valvular sounds are accentuated or not, whether the arterial tension is increased or not, whether the arteries are atheromatous or not. In the nephritis of pregnancy the amount of albumin present is a far safer guide than is the amount of urea excreted, and in this condition a sedulous watch should be kept on the daily amount of albumin which escapes by the kidneys. By thus being on the alert many cases of uræmia can be avoided by proper treatment. A physician is culpable who undertakes an anæsthesia without first assuring himself that there is no albuminuric trouble present. Lives have been needlessly shortened by the neglect of this very simple procedure. Every urine contains some albumin, but the quantity is so minute that it does not react to the ordinary tests we commonly employ. It is not a serum albumin, or serum globulin, but it is a nucleo albumin derived from the muciparous glands, and the cellular elements lining the genito-urinary tract. We sometimes find slight traces of serum albumin in apparently normal urine, but it is not physiological as we have been told by some writers. No albuminuria is a physiological process. It may only be temporary, but it is safer to regard it as pathological even when due to some temporary cause, for when the cause is removed, or ceases to exist, the albuminuria will cease. The boundary line between temporary and permanent albuminuria is very broad and ill defined, and no case can be decided without prolonged observation. We are familiar with cases of albuminuria in which it is only present when the individual assumes the erect position, being entirely absent when the person is prone. Again, we are cognizant of cases of so-called intermittent albuminuria in which albumin is present from time to time, but no other evidence of renal change is found. The vast majority of these cases recover

from this condition, but some of them ultimately become a permanent albuminuria, and subsequently develop into a nephritis, which in time becomes chronic. It is not rare to find an albuminuria in dyspeptic conditions, of either gastric or intestinal origin. Toxins and poisonous by-products, due to a destructive metabolism, gain access to the circulation by intestinal absorption, and are excreted by the kidneys, and thus give rise to renal-cell irritation with a consequent albuminuria, or the same substances are excreted as albumoses or peptones.

To the clinician and life-insurance examiner the following are the only albumins of importance:

- 1st. Serum albumin;
- 2d. Serum globulin;
- 3d. Nucleo albumin;
- 4th. The albumoses and peptones.

Many and varied are the tests proposed from time to time for the detection of albumin in the urine; but the following are the most safe and easily applicable, and are devoid of the error of a reaction other than the one sought for. These tests and their differential application are taken from the work of Crofton on *Clinical Urinology*.

The Albumins.

- No. 1. Serum albumin.
- No. 2. Serum globulin.
- No. 3. Nucleo albumin.
- No. 4. Albumoses and peptones.

Tests for the Albumins.

1. Heat and HNO_3 .
2. Nitric acid (Heller's).
3. Potassium ferrocyanide.
4. The biuret reaction.

Serum albumin responds to tests Nos. 1, 2, 3, and 4.

Serum globulin responds to tests Nos. 1, 2, 3, 4, and is also dissolved in an excess of acetic acid under test No. 3.

Nucleo albumin does not respond to test No. 1, but does to tests Nos. 2, 3, and 4. Like globulin it is precipitated by acetic acid as in test No. 3, but differs from globulin in not being dissolved in an excess of the acetic acid.

Albumoses do not respond to test No. 1, but do to tests Nos. 2, 3, and 4.

The precipitates formed in tests Nos. 2 and 3 disappear on heating but reappear on cooling.

Peptone does not respond to tests Nos. 1, 2, and 3, but does to No. 4.

In order to differentiate between serum albumin and serum globulin make test 1. If a precipitate occurs, it is either albumin or globulin.

Take a fresh portion of the urine and mix with an equal volume of a saturated solution of ammonium sulphate—the globulins and albumoses are precipitated—filter and apply test 1 for serum albumin.

In order to differentiate between globulin and albumoses dissolve the precipitate produced by the ammonium sulphate in a one per cent. caustic soda solution and add acetic acid—globulin will be precipitated while albumoses will remain in solution—furthermore, the globulin will be insoluble in solution of sodium chloride.

Nucleo albumin.—Boil the specimen, being sure it is acid, and if not so, add a few drops of *nitric acid*. Filter in order to get rid of any albumin and globulin precipitate. Apply test 3 to the filtrate. A precipitate indicates nucleo-albumin.

Albumoses.—Acidify the urine with acetic acid, and mix with an equal volume of saturated solution of sodium chloride. Heat to the boiling point and *filter while hot*. If any albumin or nucleo-albumin remain on the filter, while the filtrate contains the albumoses, on cooling they should separate out, and moreover the filtrate should give the biuret reaction.

Peptone.—Acidify 50 c.c. of the urine with 5 c.c. of HCl, and add a ten per cent. solution of phosphotungstic acid as long as a precipitate is formed and then heat. Allow it to settle, pour off the clear fluid, and dissolve the precipitate in 8 c.c. of water, to which has been added 5 c.c. of soda lye (sp. gr. 1.16). The blue solution is heated until it turns yellow, allow to cool, and then add a few drops of a very dilute solution of cupric sulphate. The biuret reaction (No. 4) should occur.

The Potassium Ferrocyanide Test.—Clear the urine by filtration. Acidify the urine by acetic acid and add a 10 per cent. solution of potassium ferrocyanide, drop by drop. If a cloudiness occur after adding the acetic acid, and before adding the potassium ferrocyanide, it may be due to

the presence of nucleo albumin, globulin, or urates, and should be filtered off before adding the potassium ferrocyanide; care being exercised not to add too much acetic acid for fear of redissolving the globulin. Bear in mind also that balsams resins, etc., which may have been taken, produce cloudiness *resembling* albumin.

Albumoses also give a cloudiness with this test, but this *disappears on heating and reappears on cooling*.

Globulin and nucleo are precipitated by this test, and if desirable to differentiate between them, the addition of more acetic acid will dissolve the globulin but will not the nucleo-albumin.

The Biuret Reaction.—Add to the urine a 10 per cent. solution of potassium hydrate and a 10 per cent. solution of cupric sulphate, drop by drop. In the presence of serum albumin and serum globulin *alone* the liquid turns *violet*; in the presence of albumoses or peptone *alone* it turns rose. If there are present the albumins and albumoses and peptone the color will accordingly be violet-rose. Be careful not to add too much copper solution for fear of blurring the solution and thus obscuring the other tints.

It has been my experience that the heat and nitric-acid test when properly applied is the most desirable test that we possess for the detection of small traces of albumin. It will show minute traces of serum albumin and serum globulin, where Heller's test and the potassium ferrocyanide test fail to do so. I am aware that the contrary to this has been stated by different writers, but I have conscientiously applied all of these tests many times and have finally decided in favor of the heat and nitric-acid test.

The great trouble about the supposed unreliability of this test has been, it seems to me, that the examiner failed to apply it under favorable conditions of clearness of specimen and proper sunlight conditions. Any one who relies on a negative test for albumin made in a poor light or by *artificial light* is not worthy of our confidence or honesty in the discharge of his duty. It is the preparation of the specimen for the application of the test that always insures accuracy. Purdy

says regarding this heat and nitric-acid test that it is subject to certain errors. "Thus if there be little albumin present and the acid be in excess, the albumin may combine with the acid, forming a soluble acid albumin, which is not precipitated by boiling. If on the other hand, the acid be insufficient to distinctly acidify the urine, and if the phosphates be in excess, a part only of the basic phosphates may be acidified, while the albumin may combine with the remainder, forming a soluble alkaline albuminate, which will not be precipitated by boiling." The heat and acid test is liable also to throw down mucin under certain unknown circumstances—but as there are no muciparous glands in the kidneys, it would have no bearing on renal trouble. But should the mucin reaction occur, we can exclude the possibility of there being any serum albumin or globulin intermixed with the cloudiness by applying the following test suggested by the same author.

Fill a clean test-tube two-thirds full of the carefully filtered urine, add to it about one-sixth of its volume of a saturated solution of sodium chloride, then drop in about three minims of acetic acid, mix thoroughly and heat the upper fourth of the liquid to boiling point. If any albumin be present it will appear as a cloud in the boiled portion, the density of this cloud indicating the proportionate amount. As confirmatory of this test Purdy further says—"After repeated and crucial investigation, the author confidently recommends this test as superior to all others for distinguishing minute quantities of albumin from other proteids in the urine—mucin or nucleo albumin included." In applying this sodium-chloride test I have been using nitric acid instead of acetic acid, in order to still further obviate any mucin or nucleo albumin reaction.

THE DIFFERENTIAL DIAGNOSIS OF THE SOURCE OF THE ALBUMINURIA.

In trying to arrive at a correct conclusion as to the probable origin of an albuminuria, we have to be guided entirely by the microscopic findings. In the first place the appearance

of the specimen to the unaided eye will give some clue. If the specimen is perfectly clear, and forms no sediment on standing or after centrifugating by the machine, and under the microscope we find no pus, casts, or blood, we are justified in ascribing the source of albumin to be of renal origin. On the other hand, suppose we find albumin, and the microscope shows only renal cells or renal-tube casts, or both together, we are still certain of the renal origin of the albumin. In trying to connect an albuminuria with a renal source, we aim to try and find some renal elements in the sediment such as renal-tube casts or renal epithelial cells. Finding the renal casts and possibly the renal cells and nothing else to account for the presence of the albumin we say the source is renal. If the renal casts are absent, as we often see in the young, and there are a few small round cells with large nuclei, and nothing else present to account for the presence of the albumin, we are still safe in saying that the source of the albumin is renal. Occasionally we find neither renal-tube casts or renal cells, nor do we find pus corpuscles or red blood corpuscles, yet we are justified in referring the source of the albumin to the kidneys, for there is nothing else present to account for it. In renal albuminuria, then, we may or may not find tube casts, or renal epithelial cells. In cases of renal calculi, renal thrombosis, renal tuberculosis, renal cancer, and all forms of acute and chronic nephritis, we generally find renal casts, and renal epithelial cells, and in addition, we may have blood and pus corpuscles.

When we come to the causes of extra-renal albuminuria and attempt to separate this from renal albuminuria, the case often becomes quite difficult. In general terms it may be said that the cause of extra-renal albuminuria is the admixture of either blood corpuscles or pus corpuscles with the urine, in some part of the genito-urinary tract, after it leaves the kidneys. The kidneys may excrete a healthy non-albuminous urine, and yet before it reaches the meatus urinarius it may become contaminated by an admixture of blood or pus, or both; and even after it is voided it may become mixed with a menstrual discharge or the discharge of a ca-

tarrhal vaginitis. Again, suppose we have a trace of albumin but no renal casts or renal cells, but quite a number of pus corpuscles, we are then justified in deciding that the source of the albumin is due to the pus and therefore extra renal in origin. If both pus and blood corpuscles are present and no renal elements are found, the chances are that the albumin source is extra renal, but we will have to be guided largely in this matter by the subjective and objective symptoms present. All of these points must be borne in mind by the microscopist and in trying to arrive at a correct deduction as to the source of an albuminuria. Given a sufficient number of pus corpuscles in any urine and you will get an albumin reaction, no matter whether you filter out the pus corpuscles or not. The water of the urine is capable of extracting the albuminous part of the pus corpuscles in a very short time. Any inflammatory disease of the urinary tract beyond the kidneys is capable of producing an outpour of blood and pus corpuscles as from a pyelitis to a urethritis, and thus causing albuminuria, hence it becomes our duty to look for any and all of the cellular elements that line this tract from the renal pelvis to the meatus urinarius. We may be able to recognize the tailed and branching cells from the superficial layers of the renal pelvis, or the rounded cell from the ureter, or the still larger cell from the bladder and urethra, and the large flat polygonal cells with small nuclei from the vagina. We should not place too much reliance in these cell findings, for their contour and their size may be changed by maceration in the specimen. However, with these cell findings and the accompanying presence of pus and blood, together with the clinical history of the case, and the subjective and objective symptoms, we are at times able to say that the blood and pus, and consequently the albumin is from such and such a source. When a renal and an extra-renal albuminuria are both associated together in the same case, the matter becomes more difficult to reconcile, and under these circumstances we can only disentangle and ascribe to each the cause on the microscopic findings.

Occasionally there appear in the urine certain disassimi-

lation products, due to faulty digestion of the native albumins, when the normal albumin digestion falls short of conversion into serum albumin. These substances are non-coagulable by heat and are known as the albumoses and peptones; and they appear in the urine under certain conditions. Normally, the blood does not contain these substances, but when they are absorbed into the blood they quickly appear in the urine. Decomposing albuminous matter in any of the tissues, such as an abscess, a pyothorax, a suppurating appendicitis or a pus tube, and, in fact, any pus formation is liable to cause the appearance of albumose in the urine.

During the first few days of the puerperium, albumose is commonly found in the urine, and is due to the absorption of the disassimilative dead albuminous debris in the process of subinvolution of the uterus. This same albumosuria is seen in cases of pneumonia during the period of the absorption of the croupous exudate. The most important form of albumosuria is that form seen in the case of pus formation. The presence of pus almost always determines its appearance in the urine. This combined with a polynuclear leucocytosis is of great importance as pointing to the formation of pus in some situation. It is often possible by this means to decide with a reasonable amount of certainty between an empyæma on the one hand and a simple serous or tuberculous pleuritis on the other, between a pus tube and an ovarian pregnancy or hæmatoma, between a purulent or a serous arthritis, a purulent or a tuberculous meningitis etc. (Crofton).

I have already given the procedure for the separation of the albumoses from the other albumins of the urine, and the description of the biuret reaction for its recognition. It is well to bear in mind also that occasionally the urine may contain some of the digestive ferments, and that under certain conditions small quantities of serum albumin may be changed into albumoses or peptones, and that thus an originally albuminous urine may fail to give any reaction for albumin, but will give a reaction for albumose under these conditions.

All of these things should make us very careful in pronouncing any specimen of urine as being perfect.

Owing to the lateness of the hour it was moved and carried that the discussion of these papers be postponed until the next day.

Adjourned until the next day at 10 A.M.

SECOND DAY.

President Fisher in the chair.

Roll call showed 26 members present, a quorum.

Moved by Dr. Fisk and carried that the discussion on last night's papers be postponed until later.

Moved by Dr. Toulmin and carried that the following resolution, offered by the Executive Committee, be adopted:

"Resolved, That all papers to be read at the annual meeting be sent to the Secretary at least thirty days before the annual meeting, so that they can be printed for distribution at that meeting."

The Executive Committee gave notice of the following Amendment to the Constitution:

"To amend Article XII, so as to read 'An annual assessment of \$5.00.'"

Notice having been given of the death of Dr. Edward W. Lambert, it was moved by Dr. Symonds and carried that a committee be appointed to draw up resolutions regarding it.

Notice having been given of the death of Dr. James Thorburn, it was moved by Dr. Young and carried that a committee be appointed to draw up resolutions regarding it.

Moved by Dr. Hamill and carried that the Executive Committee be authorized to interpret the word

“assistants” in Article III. of the Constitution to mean such medical men as may be named by the Medical Directors making the nomination.

The papers of Drs. Dwight and Craig read the previous evening were then discussed:

By Dr. Toulmin—He accepts albumin cases when there is no circulatory disturbance of any kind. He rejects cases showing albumin and casts when reported by the average medical examiner.

By Dr. Fisher—He showed some interesting statistics, based upon cases which had once been accepted for his company but which developed subsequently glycosuria or albuminuria. Both sets of cases gave a high mortality, the glycosurics having 110% of the expected and the albuminurics 236% of the expected. On the other hand, those cases in which there was a previous history of albuminuria but in which the albuminuria had disappeared at the time of examination showed but slight increase of mortality.

By Dr. Van der Poel—Persistent and recurrent albuminurics show an increased mortality, though not immediately. If the blood-pressure is over 150 mm., it is an unfavorable sign.

By Dr. Symonds—An albuminuric, as long as he shows albumin, is not a standard risk. The continued absence of albumin must be shown before the case can be accepted at standard rates.

By Dr. Bross—An applicant showing persistent albuminuria or casts should always be considered a sub-standard risk. As long as albumin is present the case should not be accepted at standard rates.

By Dr. Dwight, who closed the discussion as

follows—The crux of the whole question lies in the expertness of the urinary examination. The burden of proof lies on the applicant. The question of the selection of the good from the bad must be determined by careful investigation and the points carefully considered. His own practice is to take a case even if the urine shows albumin and casts, provided the circulatory, digestive, and nervous systems are normal.

The tellers, Drs. Devendorf and Lounsberry, reported that the following officers were elected:

PRESIDENT.

DR. JOHN W. FISHER.

1ST VICE-PRESIDENT.

DR. OSCAR H. ROGERS.

2D VICE-PRESIDENT.

DR. THOMAS H. WILLARD.

SECRETARY.

DR. BRANDRETH SYMONDS.

TREASURER.

DR. AUGUSTUS S. KNIGHT.

EXECUTIVE COMMITTEE.

DR. W. R. BROSS,
DR. GEORGE R. SHEPHERD,
DR. E. J. MARSH.

The meeting adjourned *sine die*.

The annual dinner was held in the evening at the Hotel St. Regis. The Dinner Committee, Dr.

Porter, outdid himself, both in the menu and the arrangement and decorations of the room. Altogether the affair was most enjoyable and every participant was greatly pleased. No speeches were made though several spoke.

LIST OF MEMBERS OF THE ASSOCIATION OF LIFE INSURANCE MEDICAL DIRECTORS.

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